THE FEASIBILITY OF COLLECTING HEALTH BEHAVIOR DATA FROM UNIVERSITY STUDENTS USING WORLD WIDE WEB RESEARCH TECHNOLOGY: A COMPARISON OF WEB-BASED AND MAILED, SELF-ADMINISTERED SURVEY METHODOLOGIES

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1999

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by

Lisa Nicole Pealer

ACKNOWLEDGMENTS

We must walk consciously only part way toward our goal,
and then leap in the dark to our success.
Henry David Thoreau

I would like to thank my dissertation chair, Dr. Steve M. Dorman, and committee members-- Professor David Miller, Professor R. Morgan Pigg, Jr., and Dr. Robert M. Weiler-- for creating a supportive learning environment for this experience. Each member of my committee unselfishly offered professional guidance and personal support so I could achieve this goal.

Throughout my education I have met and befriended many individuals who helped effect my decision to pursue this degree and gave me courage to continue until its conclusion. Many have been my own students, whose kinds words unknowingly reminded me of the pleasures of teaching. Many have been peers in our graduate program who I have been fortunate not only to meet, but also to teach with and attend class. They all helped instill strength and kindness, and have helped me become a better student and a better teacher. Others, I have only just begun to develop professional relationships and friendships with still offered their assistance. My sincere thanks to Stephanie Lance for her extra assistance with our class in the spring so that I could concentrate on my research, and to Denise Seabert for offering her class for my pilot study. Ms. Janice Douglas and Ms.

Ms. Elaine Kennan are both dear friends, who not only offered endless support in the office, but generously gave their time to be surrogate mothers when daily emotional support was needed.

I also would like to extend thanks to the members of my expert panel for taking time to carefully examine the University of Florida Health Behavior Survey for sensitive questions. Their review was invaluable for answering my research questions.

I also wish to thank Dr. Charles Williams, Associate Dean for the College of Health and Human Performance, for assisting me in gaining access to my study sample, and for his continued kindness throughout my doctoral studies.

Special thanks are extended to Dr. R. Morgan Pigg, Jr., and Dr. Robert M. Weiler for their combined commitment to my personal and professional success. Without Dr. Pigg's insistence that I remain true to my interest in technology, this study would not have been conceived. And without Dr. Weiler's patience and encouragement, the study could not have been executed. Without their weekly reminders of my ability and their kind words of encouragement, my own doubts would have ended the study. I am grateful for both the additional time they devoted to my study and the copious laughter which kept everything in perspective.

Finally, I wish to thank my mother and father for indulging me in my dream and for providing immeasurable emotional support; to my sister for trying to understand; and to Logan for making me take him on walks and for just being himself when that is what I needed most; and to the one person I could always depend on to make me laugh.

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Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

THE FEASIBILITY OF COLLECTING HEALTH BEHAVIOR DATA FROM UNIVERSITY STUDENTS USING WORLD WIDE WEB RESEARCH TECHNOLOGY: A COMPARISON OF WEB-BASED AND MAILED, SELF-ADMINISTERED SURVEY METHODOLOGIES

By

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August 1999

Chairman: Steve M. Dorman
Major Department: Health Science Education

Though rapidly emerging as a communications medium, the effectiveness and efficiency of the World Wide Web (Web) for survey research has not been adequately assessed. This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey. The study used a true experimental design with random assignment and included two experimental groups: the mailed, self-administered survey group and the Web-based survey group. Data were collected from 361 undergraduate students who comprised a sample (N=600) drawn randomly from a population of 22,652 students who had a free GatorLink computer account while attending the University of Florida during spring 1999. Two modified forms of the 1995 National College Health Risk Behavior Survey were developed: (1) the Web-based form, and (2) the mailed, self-administered form. Of the 600 students randomly selected to participate in the study, 361 usable questionnaires were returned yielding a response rate of 60.2%. Demographics and profile characteristics of both study groups were similar to each other and to the larger University population, suggesting that the Web-based survey did not discourage participation. Chi-square analysis found no significant difference between the response rates for the mail survey group and the Web survey group. However, a significant difference was found between the two groups on the mean number of days needed to complete and return the questionnaire. On average, participants in the Web survey group required 2.42 less days to complete and return the questionnaire than did participants in the mail survey group. Likewise, the Web-based survey required less time for preparation, publication, and data entry. No significant difference was found between the two study groups on either the number of items completed per questionnaire or the number of item completion errors. Both survey forms were equally difficult to complete. A significant difference was found between the Web group and the mail group on the number of sensitive items completed. Participants in the Web group, on average, skipped fewer sensitive items than participants in the mail group. Web-based survey participants were more inclined to disclose potentially embarrassing or sensitive information than participants in the mail group. Based on these conclusions, researchers and practitioners conducting health survey research with college students who have access to E-mail and the World Wide Web, should consider using a Web-based survey design as an alternative to a mail, self-administered survey methodology. While findings from the study may be generalized only to similar student populations attending colleges and universities with equivalent computing infrastructure, they should prove useful in research regarding other populations with access to the Internet and World Wide Web.

CHAPTER 1
INTRODUCTION TO THE STUDY

Health surveys represent a traditional source of information and a common method of research and evaluation in public health and health education (Aday, 1996; Sarvela & McDermott, 1993). Well-designed survey research provides valuable information for health care policymakers, health education and public health officials, and health consumers interested in planning, implementing, and evaluating health promotion programs, policies, and services.

The three traditional methods for health survey data collection include personal interview, telephone interview, and self-administered questionnaire. The main difference among the three modes of data collection involves the degree of contact between the participant and researcher. The data collection method a researcher chooses depends on the nature of the information sought or the research question(s), geographical location of the participants, and the need for interaction and contact with participants. The researcher also must consider monetary resources allotted for the research, in that respect, and again, the three modes differ substantially (Aday, 1996; Alreck & Settle, 1995).

Computer-assisted telephone interviewing (CATI), computer-assisted personal interviewing (CAPI), audio computer-assisted self interviewing (Audio-CASI), and computer self-administered questionnaires (CSAQ) or computer-assisted self interviews

(CASI) represent less traditional survey research methodologies, but their use is increasing in health survey research as access to personal computers in homes, offices, and classrooms increases (Aday, 1996; Finegan & Allen, 1994; Paperny, Aono, Lehman, Hammar, & Risser, 1990; Turner et al., 1998).

Increased access to personal computers also has expanded access to the Internet and has led to the development of electronic mail surveys. One feature of the Internet, electronic mail or E-mail, allows users to exchange messages, usually text, sent from one person to another by the computer. E-mail surveys circumvent many of the disadvantages of traditional surveys. Electronic surveys are less expensive, potentially access a wider geographical area, and require less time for distribution (Good, 1997; Kittleson, 1995).

The World Wide Web (Web), an Internet application, is emerging as a new tool for survey researchers. Society is witnessing and engaging in rapid and widespread use of the Web. Survey researchers have begun to take advantage of its ubiquitousness and are experiencing positive results. Web-based survey research may become a practical method for collecting health-related data.

Statement of the Research Problem

Traditional survey research is beset with methodological problems. Personal interviews often prove too costly and time consuming, and they may cause over reporting of socially desirable responses especially if sensitive information is being collected. Telephone interviews, while less costly than personal interviews, often are seen as intrusive and exclude persons in a population without telephones. Similar to personal interviews, telephone interviews can involve participants needing to please the interviewer, therefore providing socially desirable responses and creating a response effect. Self-administered questionnaires are relatively anonymous and participants are less likely to over report socially desirable responses, however self-administered questionnaires tend to have lower response rates and more mistakes in item completion (Isaac & Michael, 1995; Kiesler & Sproull, 1986; Rossi, Wright, & Anderson, 1983).

Electronic surveys, whether computer-assisted questionnaires (audio-CASI, CAPI, CASI or CSAQ) or electronic mail, require less time and are less expensive compared to personal interviewing, telephone interviewing, and mailed self-administered questionnaires. Electronic surveys are limited nevertheless in the sampling frame available. Twelve years ago Kiesler and Sproull (1986) stated "until such time as computers and networks spread throughout society, the electronic survey will probably be infeasible for general surveys" (p. 403).

In 1996, Hewson, Laurent, and Vogel estimated the existence of more than 9.5 million hosts, 1.8 million United States academic domains, and 2.43 million commercial domains creating an extensive computer networking infrastructure. Estimating the number of Internet users is more difficult and reported numbers of users varies. In 1995, the American Internet Survey estimated 9.5 million Americans, including 8.4 million adults and 1.1 million children under age 18, were using the Internet (Emerging Technologies Research Group, 1995). CommerceNet Research Center and Nielsen Internet Demographics Survey released numbers in spring 1997, estimating 220 million people over age 16 in the United States and Canada were using the Internet. In May 1998, Relevant Knowledge®, a company founded at the Advanced Technology Development Center at the Georgia Institute of Technology, reported 57 million users on the Internet's World Wide Web alone, representing a growth of 1.6 million in five months.

In January 1994, following introduction of hypertext mark up language (HTML) plus forms and Common Gateway Interface (CGI), the Graphic, Visualization, and Usability Center (GVU) in the College of Computing at Georgia Institute of Technology launched the first attempts at Web-based surveying (Pitkow & Recker, 1994). HTML Plus forms allow for point and click responses and text entry. This technology allows participants to respond to a survey in an "intuitive, non-labor intensive manner" while the results are recorded automatically by the Hypertext Transfer Protocol (http) server (Pitkow & Recker, 1994, p. 244).

GVU has since conducted six Web-based surveys. Their survey included items on general demographics, Web and Internet Usage, data privacy and censorship, politics, webmastering, and purchasing behavior (GVU, 1996). Data collected using Web-based surveys is often used for marketing purposes. However, academic researchers in fields other than computing and marketing quickly learned of the technology. Soetikno, Provenzale, and Lenert (1997) and Soetikno, Mrad, Pao, and Lenert (1997) studied patients with ulcerative colitis using Web-based surveys. Stones and Perry (1997) explored use of Web-based surveys to gather data on persons suffering from panic attacks.

The limited research conducted on Web-based surveys has yielded positive results. Web-based surveys offer distinct design elements such as check boxes, radio buttons, and text-entry boxes which limits data entry errors because the data entry is completed by the survey participant (Houston & Fiore, 1998; Schmidt, 1997; Turner & Turner, 1998). Bell and Kahn (1996), in a study collecting health status information about medical outcomes, found participants had little difficulty in completing a Web-based survey. Ninety-seven percent of their participants ($\underline{n}$ = 4876) completed the 36-item survey in less than ten minutes, with an item completion rate of 99.28%. In the same study, Bell and Kahn (1996) reported values of Cronbach's alpha of 0.76 to 0.90 for the scored scales. These values show a high degree of internal consistency and are similar to results found in the more traditional Medical Outcomes Study. The design elements and technology behind Web-based surveys show they have potential to overcome shortcomings of the traditional modes of survey research.

To date, no Web-based survey research has been conducted soliciting health behavior information. This study determined the feasibility of using a Web-based survey to collect health risk behavior data from college undergraduate students using a modified version of the 1995 National College Health Risk Behavior Survey. Comparisons were made between a traditional, mailed, self-administered form of the College Health Risk Behavior Survey and a Web-based form to determine if differences exist in the survey methodologies.

Purpose of the Study

This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey. The study provided (1) information about methodological trade-offs between traditional mailed, self-administered questionnaires and Web-based surveys; (2) indications of participant willingness to answer sensitive questions using Web-based surveys; and (3) development of a prototype for collecting college health risk behavior data using Web-based surveys.

Need for the Study

A tremendous amount of research has been conducted to examine the advantages and disadvantages of the three traditional methods of health survey research. Studies on the effectiveness of computers in survey research focused primarily on computer-assisted telephone interviews (Aday, 1996; Beebe, Mika, Harrison, Anderson, & Fulkerson, 1997). Computer-assisted survey research soliciting information from individuals is still relatively new and undeveloped (Aday, 1996; Beebe, Mika, Harrison, Anderson, & Fulkerson, 1997).

Paperney et al. (1990) found younger populations more likely to feel comfortable with and flexible to the use of computers in survey research. Johnston & Walton (1995) found adolescents prefer computer questionnaires over traditional paper and pencil questionnaires.

As Turner et al. (1998) stated, "Surveys of risk behaviors have been hobbled by their reliance on respondents to report accurately about engaging in behaviors that are highly sensitive and may be illegal" (p. 867). Studies employing computer-assisted survey methodology yielded mixed results in the collection of sensitive information. In a study of health risk behaviors among adolescent males, Turner et al. (1998) found participants using audio-CASI reported male-male sex, injection drug use, and sexual contact with intravenous drug users at rates three times higher than participants using traditional self-administered questionnaires. Kiesler and Sproull (1986) also found participants to be more self-disclosing with electronic surveys compared to the traditional paper and pencil format. Beebe, Harrison, McRae, Anderson, and Fulkerson (1998) also conducted a study using computer-assisted self-interview in a school setting, but their participants did not report higher prevalence of health risk behaviors. They discovered that the close proximity of student seating in the school computer laboratories discourage candor and contributed to the results, thus raising research setting issues for future computer-assisted interviewing research.

Web-based surveys employ similar technology as computer-assisted self-interviewing. Web surveys, however, differ in that they do not require experimental laboratories and they allow for instantaneous data management (Houston & Fiore, 1998). Participants who can find the Uniform Resource Locator of a Web-based survey, can complete the questionnaire at their convenience. Participants might need to visit a computer center to access the Web and complete the survey, in which case close proximity to other people may present an issue. In this case, however, it is unlikely that non-survey participants in a laboratory would be aware of the nature of the Web page the person is visiting.

Web-based surveys hold the potential to overcome a fundamental problem in the collection of health survey data. Because Web-based surveys are completed in privacy, such surveys do not encourage participants to misstate answers or give socially desirable responses to sensitive questions as found in other survey methods (Bloom, 1998).

Supplementary to assisting in the collection of sensitive data, Web-based surveys can access large populations of individuals in three ways: researchers using Web-based surveys can allow uncontrolled access to the survey; respondents may be selected by traditional sampling techniques then referred to the Web-based survey to complete the questionnaire; or participants must meet certain criteria before access to the survey is granted (Schmidt, 1997).

Web-based surveys also can save time and money and possibly eliminate the need for paper resources (Schmidt, 1997). Collecting data with a Web-based survey is immediate and data analysis is eased because computers interpret responses as the survey is submitted and data are exported for analysis. This aspect of Web-based surveying reduces costs associated with data collection and data entry, and the errors in data coding (Gaddis, 1998; Hewson, Laurent, & Vogel, 1996; Houston & Fiore, 1998; Schmidt,1997).

Research Questions

The study answered five research questions:

1. Does a difference exist between response rates for the mailed, self-administered survey and the Web-based survey?
2. Does a difference exist between response time for the mailed, self-administered survey and the Web-based survey?
3. Does a difference exist in the number of items completed for the mailed, self-administered survey and the Web-based survey?
4. Does a difference exist in item completion errors between the mailed, self-administered survey and the Web-based survey?
5. Does a difference exist in the number of sensitive items answered between the mailed, self-administered survey and the Web-based survey?

Research Variables

The study included one independent variable: survey method. The study examined two forms of the independent variable. The first form was a mailed, self-administered questionnaire participants received by United States postal mail. The second form was a Web-based questionnaire participants completed and submitted on the Web. The study's dependent variables included response rate and response time, number of items completed and item completion errors, and number of sensitive items completed.

Research Design

This experimental study compared two methods of collecting survey data about college student health behaviors. Two modified forms of the 1995 National College Health Risk Behavior Survey (NCHRBS) were developed (Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion [DASH], 1997). One form was constructed as a traditional paper-and-pencil, self-administered questionnaire delivered to participants through regular United States postal mail (Appendix A). The second form was prepared for Web-based administration (Appendix B). Both forms contained identical items, and the content sections were organized and presented in the same order. Participants were randomly assigned to the mailed, self-administered survey group or the Web-based survey group.

Study Population

The defined population for the study included all University of Florida undergraduate students who had a GatorLink account. All students who attend the University of Florida may obtain a GatorLink account free of charge, and they have limited access to a computer in the free computer laboratories around campus. In June 1998, the University of Florida instituted a student computer requirement. All students must have "access to and on-going use of" a computer (University of Florida, 1998). Software recommendations accompanying the requirement included an Internet software, for E-mail and access to the World Wide Web, such as Netscape® or Microsoft Internet Explorer. Internet software is available at no charge to University of Florida students.

Instrumentation

Two modified forms of the 1995 National College Health Risk Behavior Survey (NCHRBS) were developed for the study (DASH, 1997). The first form, University of Florida Health Behavior Survey-M (UFHBS-M) was a modified NCHRBS mailed by regular postal mail. Form two, University of Florida Health Behavior Survey-W (UFHBS-W), was a modified NCHRBS developed for Web-based administration. Both forms of the questionnaire contained identical items, and content sections were presented in the same order.

One question was added to each questionnaire for the purposes of the study. The UFHBS-M included one item asking participants if they would have been willing to complete the questionnaire in a Web-based format. The UFHBS-W included one item designed to identify the location where participants completed the questionnaire. Thus, both forms of the questionnaire contained 99 items.

Data Collection

The sample was randomly assigned to the UFHBS-M group and UFHBS-W group. The entire sample received a postcard by regular United States postal mail and an electronically mailed pre-notification message about the forthcoming survey (Appendix C). The pre-notification postcard and the E-mail both were mailed on March 17, 1999.

The self-administered questionnaire, in the form of a survey packet, was mailed on March 22, 1999, six days following the pre-notification E-mail message and postcard. Participants assigned to the UFHBS-M group received in the mail a survey packet that contained a cover letter (Appendix D); the questionnaire; and a pre-addressed, postage-paid return envelope. Participants in this group marked their responses directly in the questionnaire booklet.

Participants assigned to the other half of the sample, the UFHBS-W group, were E-mailed a message (Appendix E) on March 23, 1999 asking them to participate in the Web-based survey. If participants chose to participate, they could link directly from the E-mail message to the Web-based survey. The URL linked participants to the Web-based survey cover letter and general instructions (Appendix F). At the end of the questionnaire, participants were instructed to select the “submit now” button to send the answers by E-mail to the researcher. After they selected the “submit now” button, participants immediately received an electronic thank-you on the screen.

On March 31, 1999, participants were sent both a reminder postcard and an E-mail message (Appendix G). Participants in both groups received a $2 bill as compensation for their participation.

After four weeks, a computation of the initial response rate was calculated for both groups. Based on the interim results, the researcher decided to mail a second follow-up letter would be mailed by regular postal mail to participants in both groups who had not yet responded. A second follow-up E-mail also was sent to participants in both groups.

Data Analysis

Data collected from UFHBS-M were transferred from the paper questionnaire to electronic answer sheets (scantron sheets). The data then were scanned, saved in ASCII format, and read and analyzed using the Statistical Analysis System (SAS). Data collected using the UFHBS-W were automatically formatted, E-mailed to the researcher, and transferred to the UFHBS-W database developed by the Web-based survey software, Perseus.

Descriptive statistics were generated for both groups to develop a demographic profile of the sample. Response rates, response times, item completion, item completion errors, and number of sensitive items completed also were calculated.

Inferential statistics were used to examine effects between the independent variable and dependent variables identified in research questions one through five.

Delimitations

The following delimitations should be considered when interpreting the study findings:

1. Participants were randomly selected from a list of all University of Florida undergraduate students who had a GatorLink account during the 1999 Spring semester and who were enrolled during the 1999 Spring Semester.
2. Participants must have had a GatorLink account provided by the University of Florida.

3. Participants must have voluntarily agreed to participate in the study.
4. Participants were randomly assigned to one of two groups: mailed, self-administered University of Florida Health Behavior Survey group, UFHBS-M; or Web-based University of Florida Health Behavior Survey group, UFHBS-W.
5. Participants randomly assigned to the UFHBS-M group must have been able to read, understand, and comply with instructions for the study.
6. Participants randomly assigned to the UFHBS-W group must have been computer literate and able to read, understand, and comply with instructions for the study.
7. Students will have had access to computer hardware and operating system hardware to participate in the study.
8. Data were collected during the 1999 Spring semester at the University of Florida.

Limitations

The following limitations should be considered when interpreting the results of the study:

1. Undergraduate students enrolled at the University of Florida during the 1999 Spring semester and who had a GatorLink account may not have been representative of all students enrolled at the University of Florida during the 1999 Spring semester.
2. Not all students enrolled at the University of Florida during 1999 Spring semester had a GatorLink account.

3. Participants who voluntarily agreed to participate in the study may not have represented all students enrolled at the University of Florida during the 1999 Spring semester who had a GatorLink account.
4. The UFHBS-M group and UFHBS-W group did not represent all of the methods available for health survey data collection.
5. Not all participants assigned to the UFHBS-M group may have been able to read, understand, and comply with instructions for the study.
6. Not all participants assigned to the UFHBS-W group may have been computer literate and able to read, understand, and comply with instructions for the study.
7. Variations in the participants computer hardware and operating system software could have affected the subjects' participation in the study.
8. Participants enrolled at the University of Florida during the 1999 Spring semester may not have been representative of all students enrolled during the 1999 Spring semester or the 1998-1999 academic year.

Assumptions

For the purposes of this study, the following assumptions were made:

1. Undergraduate students who had a GatorLink account during the 1999 Spring semester, and who were enrolled during the 1999 Spring semester at the University of Florida, were considered sufficiently representative of all undergraduate students enrolled at the University of Florida during the 1999 Spring semester.

2. Students enrolled at the University of Florida during the 1999 Spring semester who had a GatorLink account were considered the potential population from which to obtain participants.
3. Students who voluntarily agreed to participate in the study were considered sufficiently representative of all undergraduate students enrolled at the University of Florida during the 1999 Spring semester who had Gator Link account.
4. The research design was considered appropriate for the purpose of the study.
5. Participants assigned to the UFHBS-M group were assumed capable of reading, understanding, and complying with instructions for the study.
6. Participants assigned to the UFHBS-W group were assumed to be computer literate, and capable of reading, understanding, and complying with instructions for the study.
7. Variation in the participants' computer hardware and operating system software was not considered problematic in achieving the study's purpose.
8. Participants enrolled at the University of Florida during the 1999 Spring semester were considered representative of all students enrolled during the 1999 Spring semester.

Definition of Terms

The operational definitions of many terms used throughout this study include:

ASCII (American Standard Code for Information Interchange or ASCII): The international standard for code numbers used by computers to represent upper and lower-case Latin letters, numbers, punctuation (Internet Literacy Consultants [ILC], 1998).

Browser: Web client software used to navigate the information available on the World Wide Web and other Internet resources. A host server transfers hypertext data, graphics, text formats, and other multimedia effects to a client, then the Web browser interprets and displays the information (Davis, 1995). Examples of Web browsers include Netscape Communicator and Microsoft Internet Explorer (ILC, 1998).

Client: A software program used to contact and obtain information from a server software program on another computer. Client programs are designed to work with one or more specific kinds of server programs, and each server requires a specific kind of Client. A Web Browser is a specific kind of Client (ILC, 1998).

CGI (Common Gateway Interface or CGI): A set of rules that describes how a Web Server communicates with other software on the same machine, and how the other software, or the CGI program, communicates to the Web Server. A typical CGI program takes data from a web server and places the contents of a form into an E-mail message or turns the data into a database query (ILC, 1998).

Cyberspace: The term originated in the novel, Neuromancer, by William Gibson, and described a "whole range of information resources available through computer networks" (ILC, 1998).

Domain Name: The name that identifies an Internet site. Domain names are unique and they include two or more parts separated by a dot or period (ILC, 1998). For example, "cdc.gov", or "ufl.edu" are domain names.

Electronic Mail or E-mail: A feature of the Internet which allows users to exchange messages, usually text, sent from one person to another by computers (Kittleson, 1995).

GatorLink Account: A computer identification which allows all University of Florida students, faculty, and staff access to a number of computing resources. Basic services for users include free E-mail, fifteen hours per month of free dialup Internet connection with a modem, access to the Integrated Student Information System, and free access to microcomputers in the campus computer laboratories. Computers in the labs are equipped with an Internet connection, access to E-mail, word processors, spreadsheets, and graphics programs (University of Florida, 1998).

Gateway: "A hardware or software set-up that translates between two dissimilar protocols" or "any mechanism for providing access to another system, e.g. America Online might be called a gateway to the Internet" (ILC, 1998).

Hit: The term, when used in reference to the World Wide Web, that refers to a request from a web browser for a single item from a web server. Hits are often used as "a measure of load on a server" (ILC, 1998).

Home Page or Homepage: The main web page for a business, government, or individual. The main page of a collection or series of pages also is considered the homepage (ILC, 1998).

Host: Any computer on a network that serves as a storage center for services available to other computers on the network (ILC, 1998).

HTML: Hypertext Markup Language, or HTML, is the coding language used to create Hypertext documents for use on the World Wide Web. HTML documents are read using a World Wide Web Client program such as Netscape® (ILC, 1998).

HTTP (Hypertext Transport Protocol): The protocol for transferring files across the Internet, and the most important protocol used in the World Wide Web. The protocol requires an HTTP client program on one end and an HTTP server program on the other end (ILC, 1998).

Hyperlinks: Text or images that link to other documents when selected (ILC, 1998; Santoro, 1994).

Hypertext: Text that contains links to other documents. They include words and/or phrases in a document that when selected by the click of a mouse, cause another document to be retrieved or displayed (ILC, 1998).

Internet: "The set of all connected computers that are networked using the TCP/IP protocol and who have assigned IP numbers and fully-qualified domain names" (Santoro, 1994, p. 75). The Internet includes a global network connecting thousands of individual computer networks. A 1996 estimate identified more than 16,000 networks with 15 to 20 million users. The Internet also is known as the "information superhighway" (Davis, 1995; Santoro, 1994).

Intranet: A private computer network existing within an organization. Intranets use the same software found on the Internet, but for internal organization use only (ILC, 1998).

Item completion mistakes: The number of unacceptable responses given by a respondent on a questionnaire.

Item completion: The total number of items completed by a respondent on a questionnaire.

Item completion rate: The number of responses divided by the total number of items on a questionnaire (Goyder, 1987).

Links: Also known as hyperlinks or hypertext (ILC, 1998; Santoro, 1994).

Microsoft Internet Explorer: A Web browser, or client software, used to navigate the information available on the World Wide Web and other Internet resources. Microsoft Internet Explorer is based on the Mosaic program developed at NCSA, the National Center for Supercomputing Applications (Microsoft Internet Explorer, 1995).

Modem: Part of the personal computer equipment that connects a computer to a telephone. A modem may be internally located or externally located (Stussman, 1996).

Netscape®: A Web browser, or client software, used to navigate the information available on the World Wide Web and other Internet resources. It is also the name of a company. Netscape® is based on the Mosaic program developed at NCSA, the National Center for Supercomputing Applications. Netscape® is recognized as the best and most popular web browser (ILC, 1998).

Reliability: The repeatability or reproducibility of "measures of the same concept over time or across methods of gathering data" (Aday, 1996, p. 50).

Response effect: The amount of error in the response to a question associated with a particular factor (Wentland & Smith, 1993).

Response rate: The percentage of a sample who responded to the survey and provided usable, completed questionnaires (Alreck & Settle, 1995).

Response time: Calculated as time in days from the day the researcher mails survey packets to participant, participant receives packet and completes questionnaire, returns questionnaire to the researcher, and the day the researcher receives completed questionnaire (Opperman, 1995).

Search Engine: Services provided on the web programmed to look for documents containing words entered into a query box (Netscape, 1998). Popular Web Search Engines include AltaVista, Excite, HotBot, Lycos, Netscape, WebCrawler, and Yahoo.

Server: "A computer, or software package, that provides a specific kind of service to client software running on other computers" (ILC, 1998). The term may refer either to the software or to a machine. A single server machine may house several different server software packages, therefore providing many different servers to clients on the network (ILC, 1998).

Socially desirable responses: Responses given based on what participants perceive as being "socially acceptable or respectable" (Alreck & Settle, 1995, p. 100).

URL (Uniform Resource Locator): The address format for resources on the World Wide Web (ILC, 1998). A URL should resemble this example: <http://www.ufl.edu/research.html>. URLs are entered into a Web browser, such as Netscape.

World Wide Web, WWW, or Web: An Internet application based on hypertext. The World Wide Web is capable of supporting not only text documents, but also graphics, sound, videos, databases, and three dimensional moving objects (December, 1994; Gauger, 1994; Santoro, 1994). The World Wide Web is connected to the Internet, but it does not allow users to access all aspects of the Internet (Lomarcan, 1995).

Web-based survey : A traditional paper and pencil survey, or an original survey, converted to a form for publishing on the World Wide Web. A Web-based survey has an assigned form handler, which is the CGI script on the server that receives data from the forms fields and processes it to return as a completed survey response (Truppin, Benson, Nelson, Washburn, & Henning, 1997)

Summary

Chapter 1 provided an overview of the study, discussed the purpose of the study, need for the study, significance of the study, research questions, variables, research design, study population, instrumentation, data collection, data analysis, delimitations and limitations, assumptions, and definitions of terms. Chapter 2 provides a review of the literature, discussing related research on traditional survey methodologies, computer-assisted survey methodologies, E-mail surveys, and Web-based surveys. A brief discussion on the origin and development of the National College Health Risk Behavior Survey and the software used to create a Web-based form of the questionnaire are included as well.

CHAPTER 2
REVIEW OF LITERATURE

This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey. The literature review provides support for the study's purpose and need. This chapter is organized as follows: an overview of survey research, with a focus on the traditional methods of survey research (personal interview, telephone interview, and self-administered questionnaire) and computer-assisted methods; an overview of the Internet and World Wide Web, discussing their current uses in survey research such as electronic mail surveys; an overview of health risk behavior surveillance systems and the National College Health Risk Behavior Survey, outlining the purpose of and need for the survey; and a presentation of the software application used to create the Web-based format of the College Health Risk Behavior Survey.

Survey Research

Surveys date back to Ancient Rome and Greece when they were used to generate "global characterizations and very rough approximations" of population settlements and states (Rossi, Wright, & Anderson, 1983, p. 2). In more recent history, the creators of the United States' Constitution mandated a national census, however, its inclusion was for the even division of territory (Rossi, Wright, & Anderson, 1983). Topics other than head counts were quickly added to the U.S. census at the realization that effective state management required information concerning the status and characteristics of the population (Rossi, Wright, & Anderson, 1983).

The early 1900s witnessed the emergence of social surveys that included topics not covered by the national census such as housing conditions, but they too were designed as a census and used enumeration rather than sampling (Alreck & Settle, 1995; Rossi, Wright, & Anderson, 1983). It was not until the post-World War I era that consumer marketing research developed a new model for surveys--the laboratory model--where participants were selected and brought to a specified location for testing (Rossi, Wright, & Anderson, 1983).

Modern survey research emerged from this extensive foundation and still has a similar purpose as the historical survey and census, that is to collect information from individuals about specific topics using instruments (i.e. self-administered questionnaires, personal interviews) to generate statistics representative of the group or groups (Aday, 1996; Alreck & Settle, 1995; Gall, Borg, & Gall, 1996; Fink, 1985; Rossi, Wright, & Anderson, 1983).

Today, survey research is a popular method of inquiry in education, behavioral, social and health sciences. However, the quality of survey data depends on the amount of time and resources committed to the project, careful planning, and a well-executed design (Aday, 1996; Alreck & Settle, 1995; Rossi, Wright, & Anderson, 1983; Sarvela & McDermott, 1993).

Many health surveys have been conducted with the earliest record of a health survey dating back to the early 1900s (Aday, 1996). Health surveys have covered a host of topics but consistently focus on "factors that directly or indirectly influence, measure, or affect people's health" (Aday, 1996, p. 10). Aday (1996) in a framework for classifying health surveys identified six domains: (1) characteristics of the environment (i.e. political, cultural, social, economic, and physical), (2) characteristics of the health care system (i.e. organizations, insurers, and professionals), (3) characteristics of the population (i.e. demographics, attitudes, knowledge, behavior, and resources), (4) health status (i.e. physical, mental, and social), (5) utilization of services (i.e. type, site, purpose, and time interval) and expenditures (i.e. total and out-of-pocket), and (6) satisfaction (i.e. general and visit specific). A health survey may focus on one of the six categories, or it may include related topics to examine the relationships between categories.

Though numerous health topics have been the purpose of various survey research projects, the trusted methods for collecting data have remained relatively constant. The three traditional data collection methods fundamental to survey research are the personal interview, telephone interview, and self-administered questionnaire (Aday, 1996; Alreck & Settle, 1996; Fowler, 1984; Rossi, Wright, & Anderson, 1983).

Traditional Survey Research

Personal interviews are conducted face-to-face with research participants. The interviewer can "present visual materials such as rating cards, pictures, or displays. Physical objects can be presented....to see, feel, hear, taste, smell, handle, and even consume" (Alreck & Settle, 1995, p. 33). Personal interviews are flexible and may be designed to collect data from participants at home, work, or other locations specific to the survey topic (Alreck & Settle, 1995; Fowler, 1984). Personal interviews have been found to quickly gain participant cooperation, are able to maintain interest level for an extended period of time, and develop a rapport with participants. The ability to interact with participants allows interviewers to assess verbal and nonverbal cues that indicate boredom or lack of interest and therefore are able to adjust the personal interview accordingly.

Personal interviews often require additional staff to assist in conducting the interviews. Therefore, a prerequisite for this method is interviewer training. Interviewer training ensures uniformity and reliability (Alreck & Settle, 1995; Fowler, 1984; Rossi, Wright, & Anderson, 1983). Such training, however increases the overall cost of data collection, making it the most expensive method of data collection per survey participant (Aday, 1996; Alreck & Settle, 1995; Fowler, 1984; Isaac & Michael, 1995).

Personal interviews offer several advantages. The level of personal attention allowed per participant is a distinct advantage. This personal attention allows for interviewer probing and participants are able to provide in-depth responses. Personal interviews also are flexible and accommodating. For example, interviewers can schedule the interviews to fit the needs and schedule demands of participants. Interviewers are able to include verbal and nonverbal cues and environmental cues into an interview contributing to data collection (Aday, 1996; Alreck & Settle, 1995; Fowler, 1984; Isaac & Michael, 1995).

Personal interviews are not without disadvantages. Personal interviews are considered the most expensive and time consuming method of collecting data in survey research. Interviewer characteristics such as race, ethnicity, socioeconomics, may offend research participants. Personality conflicts may arise from the personal interview and interfere with the process. Also with personal interviews, anonymity is difficult to provide. Personal interviews require well-trained interviewers or data collection may be subject to interviewers knowingly or unknowingly manipulating or introducing bias into the data (Aday, 1996; Alreck & Settle, 1995; Fowler, 1984; Isaac & Michael, 1995).

Telephone interviewing also requires interviewers, but this data collection method does not require interviewers to enter the field. Unlike personal interviews, this method is limited to verbal communication transmitted over a telephone line. Interviewers are unable to see the nonverbal cues participants provide and are able only to discern participant interest by tone of voice, word choice, and other verbal cues (sighs, grunts, etc.). Therefore, telephone interviewers are not as likely as personal interviewers to develop a rapport with study participants (Aday, 1996; Alreck & Settle, 1995; Isaac & Michael, 1995).

The lack of physical presence of an interviewer may create a greater sense of anonymity for the participant so they are more willing to answer sensitive questions. Additionally, telephone interviews mandate shorter interviews than personal interviews. Research has found interviews exceeding 15 to 20 minutes in length often confront resistance or premature termination (hang ups) (Aday, 1996; Alreck & Settle, 1995; Isaac & Michael, 1995; Johnston & Walton, 1995).

There are five advantages to telephone surveys. First, telephone surveys are less expensive than personal interviews. Second, like personal interviews, they are flexible and may be conducted during the day or in the evening. Third, telephone survey interviewers can easily conduct follow ups. Fourth, because the telephone survey often takes place in the home, participants are comfortable and may choose to disclose sensitive information. Last, telephone surveys can reach a broad geographical area (Aday, 1996; Alreck & Settle, 1995; Fowler, 1984; Isaac & Michael, 1995).

Similar to other data collection methods, telephone surveys have disadvantages. Telephone surveys automatically eliminate persons in the population of interest who do not have telephones or have unlisted telephone numbers (unless the study used Random Digit Dialing approach to generate telephone numbers). Participants often view telephone surveys as inconvenient and irritating and an invasion of privacy. Lastly, telephone interviewers are not able to gather important nonverbal cues provided by participants (Alreck & Settle, 1995; Fowler, 1984; Isaac & Michael, 1995).

Of the three traditional methods of data collection in survey research, the self-administered questionnaire (SAQ) is the most common and differs dramatically from the personal interview and telephone interview (Alreck & Settle, 1995; Isaac & Michael, 1995; Sarvela & McDermott, 1993). The two most common types of self-administered questionnaires are the mail questionnaire and the group-administered questionnaire.

Participants included in survey research using a mail SAQ, "receive the questionnaire in the mail, read the accompanying letter or instructions, and fill it out at home or elsewhere at their leisure" (Rossi, Wright, & Anderson, 1983, p. 198). There is not an interviewer present or on the telephone to assist with this method of collecting data (Alreck & Settle, 1995; Fowler, 1984; Rossi, Wright, & Anderson, 1983).

Mailed SAQs are generally less expensive, and if well-designed can be simple, clear, and can reach a large population. Self-administered questionnaires also can be anonymous. However, SAQs have certain disadvantages. Mailed SAQs tend to have lower response rates than personal interviews and telephone interviews. Also, the researcher cannot be certain participants understood the questions as intended and the addressee was the person who completed the questionnaire (Fowler, 1984; Isaac & Michael, 1995; Rossi, Wright, & Anderson, 1983).

Another type of self-administered questionnaire is the group-administered questionnaire with an interviewer or proctor present. This is most commonly used with students in a classroom, employees on the job, and shoppers in a mall (Rossi, Wright, & Anderson, 1983). Unlike mail SAQs, with group SAQs the interviewer can answer participant questions and ensure a higher completion rate. However, the presence of an interviewer increases the overall cost of SAQ as a data collection method. Unlike mail SAQs, group SAQs cannot guarantee anonymity (Rossi, Wright, & Anderson, 1983).

Common Elements of Traditional Survey Research

Aday (1996) identified six common elements of the three traditional methods of survey research and classified each as either an advantage or disadvantaged. The six common elements are: (1)sampling, (2) item development, (3) questionnaire development, (4) conducting the survey, (5) data analysis, and (6) costs (Aday, 1996).

Each element is further divided into applicable survey research concepts, for example sampling includes the concepts of coverage of the population, response rates, noncoverage, and accuracy in selecting participants.

Sampling in survey research should ensure that everyone in the population of interest has a chance of being included in the survey sample--coverage of the population (Aday, 1996). Telephone interviews, however, exclude some members of a population because the sample includes only persons with telephones. Even though statistical adjustments can be made for noncoverage of certain groups to make telephone interview survey samples more representative, such adjustments do not remove all possible biases (Aday, 1996).

Self-administered questionnaires also are subject to problems of population coverage. A common method for identifying study participants is by use of lists of members, such as members of a professional organization or student enrollment. However, population coverage problems occur if lists are not kept current, are poorly managed, or contain duplicate names (Aday, 1996).

Response rate refers to “the proportion of people or organizations selected and deemed eligible for the study that actually completes the questionnaires” (Aday, 1996, p. 99). The three traditional methods of data collection differ in response rate calculations.

Calculating response rates for personal interviews is difficult because it is not always possible to determine if a household or individual is eligible for the study. For telephone interviewing, particularly those employing random digit dialing, calculation of response rates is difficult because many telephone calls are not completed due to busy signals, no answer, or answering machines. This problem is intensified with the growing use of beepers, cellular telephones, and caller-identification services, all of which are barriers to conducting telephone interviews. Households increasingly use such services and devices to screen telephone calls which lowers response rates (Aday, 1996).

Self-administered questionnaires also experience problems when computing response rates. Questionnaires may not be completed yet returned either due to participant refusal to complete or the participant was no longer in residence at the address on file (moved and left no forwarding address or deceased) (Aday, 1996).

Research has found a number of factors contributing to the higher response rates for personal interviews: influence of personal contact, inability for participants to prematurely and abruptly terminate interview, and interviewer ability to conduct a follow up with participants (Aday, 1996). The response rates for self-administered questionnaires, particularly mailed questionnaires, tend to be the lowest, followed by telephone interviews, and then personal interviews (Aday, 1996).

Extensive research has been conducted on health surveys, specifically on improving response rates to self-administered, mailed questionnaires. Mail surveys continually suffer from low response rates which may be a source of bias (Gilbert, Longmate, & Branch, 1992; O'Rourke & O'Rourke, 1983). Gilbert, Longmate, and Branch (1992) stated "bias can occur when different response rates are obtained among subgroups of the sample, or when nonresponse is correlated with the outcomes of interest and their explanatory correlates" (p. 577). Limiting nonresponse bias is achieved by maximizing response rate (Gilbert, Longmate, & Branch, 1992).

Several literature reviews have focused on specific strategies for improving the response rate for self-administered questionnaires and included: pre-contact letters, personalization, type of cover letter, incentives, return envelopes and follow-ups (Kanuk & Berenson, 1975; O'Rourke & O'Rourke, 1983). Kanuk & Berenson (1975) stated, however "the only techniques which seem to be consistently effective in increasing response rates are follow-up letters and monetary incentives enclosed with the mail questionnaires" (p. 440).

Pre-contact letters, contact with participants prior to their receipt of the mail questionnaire or advanced notification, have been shown to increase response rate. Personalization of envelopes and cover letters also have been shown to increase response rate. O'Rourke and O'Rourke (1983) also reported that a cover letter emphasizing the importance of the respondent rather than the importance of the research increases response rate.

Incentives increase response rate. O'Rourke and O'Rourke (1983) in their review of the literature found while response rates increase by 8% with a nominal $0.10 incentive, non-monetary incentives such as a copy of survey results have no effect on response rate. The most effective monetary incentives are those enclosed with the first mailing rather than promised upon receipt of the completed questionnaire (Denton, Tsai, & Chevrette, 1988). Additionally, return envelopes and follow-up letters increase response rate.

Return envelopes are essential and participants should never be expected to pay for returning the questionnaire. Kanuk & Berenson (1975) in a review of the literature reported a response rate of 62% in favor of the use of return envelopes versus 26% without return envelopes. Follow-ups are the most successful method for increasing response rates regardless of the form (i.e. postcard reminder, duplicate questionnaires, letter alerts, or telephone reminders). The usual number of follow-ups reported is one or two with each effort increasing response rate (Kanuk & Berenson, 1975; O'Rourke & O'Rourke, 1983).

Noncoverage and nonresponse refer to inaccurate estimates of the entire survey or specific populations due to under representation in the study (Aday, 1996). Goyder (1987) stated "researchers conducting a survey desire the maximum response rate because nonresponse biases results, unless the pool of nonrespondents constitutes a perfect random subset of the total sample" (p. 11). The survey method chosen should reflect considerations of noncoverage and nonresponse and should "provide the most accurate and complete data" for the group understudy (Aday, 1996, p. 102).

Personal interviews and telephone interviews offer advantages over mail self-administered questionnaires when considering participant selection. The researcher cannot guarantee the person who completed the mail self-administered questionnaire was the intended participant (Aday, 1996).

Item development, which includes type of item and non-threatening and threatening items, have distinct advantages and disadvantages when comparing the three traditional methods of data collection in survey research. Research has found difficult concepts and wording, or complex item format (contingency formats) are easier to manage in personal interviews (Aday, 1996). Interviewers are able to interpret participants' verbal and nonverbal cues in response to misunderstood items. Participants also are able to ask questions if they have not understood a particular item or concept. Self-administered questionnaires with complex concepts and item formats may require specific instructions. The researcher must assume that participants are able to understand both the concepts and the instructions.

Open-ended questions are often used in surveys. Open-ended questions are those questions where participants answer in their own words rather than being forced to choose a response option. Personal interviews have been found to provide the best environment for such questions. Telephone interview participants tend to give shorter answers to open-ended questions. Aday (1996) does not recommend using open-ended items with self-administered questionnaires because participants are less likely to dedicate the time needed to answer these types of questions. Also participants must be capable of writing a clear response.

Survey items may be classified as non-threatening and threatening or sensitive (Aday, 1996). Non-threatening items are innocuous and not likely to provoke strong emotional responses, for example asking a participant what they ate for lunch. Threatening or sensitive items tend to be more personal, often embarrassing for participants, and may center around topics related to sexual behaviors and drug and alcohol use. Tourangeau and Smith (1996) stated "a question is sensitive if it raises concerns about disapproval or other consequences (such as legal sanctions) for reporting truthfully or if the question itself is seen as an invasion of privacy" (p. 276).

Health surveys often deal with sensitive issues. The literature on sensitive questions shows the method of data collection used in survey research can affect the answers participants report (Tourangeau & Smith, 1996). Turner et al. (1998) found self-administered questionnaires provide a greater sense of confidentiality or anonymity and therefore encourage more accurate responding to sensitive items. Aday (1996) reported issues such as clinical depression, physical disability, and sexual behaviors have been reported with equally or more frequently with telephone interviews compared to personal interviews. Analysis of studies comparing self-administered questionnaires with personal interviews showed the self-administered questionnaires increase reporting of abortions, alcohol consumption, and illicit drug use (Tourangeau & Smith, 1996).

Questionnaire format which includes length and item sequence is the third aspect of survey having distinct advantages and disadvantages when comparing the three traditional methods of data collection in survey research. Lengthy questionnaires are better suited for personal interviews. Interviewers are better able to prevent premature termination of an interview, deal with participant boredom, and decreased motivation (Aday, 1996). Self-administered questionnaires do not have such controls in place, therefore they should be kept short to encourage participant response. However, O'Rourke and O'Rourke (1983) found in their review of survey research literature that response rates do not dramatically decrease in relation to questionnaire length. Their review found that the "length of questionnaire is much less important than the ease in which it can be filled out and the interest of the respondent in the topic" (O'Rourke & O'Rourke, 1983, p. 13).

Telephone interviews, even if lengthy, can be successful and achieve a high response rate. Aday (1996) stated, however, it may be the nature of health surveys that is successful in this regard because participants tend to be more interested in discussing their health than consumer product marketing or politics.

Researchers often need to control item sequence, but this can only be achieved with personal interviews and telephone interviews. Self-administered questionnaires can be completed in the desired order of the participant (Aday, 1996). Typically, there is no interviewer or proctor present to control the order in which participants complete the instrument. With self-administered questionnaires, participants can review all items prior to completing it. Also, participants may choose to complete items at the end of the instrument first. The flexibility of the self-administered questionnaire makes controlling item sequence difficult, if not impossible.

Conducting the survey, which includes supervision of interviewers and length of data collection period is the fourth aspect of survey research having distinct advantages and disadvantages when comparing the three traditional methods of data collection in survey research. Telephone interviews, with a centralized telephone bank, allow for close supervision. In contrast, individual interviewers conducting personal interviews may be scattered over an area making supervision difficult.

The time frame for the data collection period should be considered. Personal interviews require more time than telephone interviews. Personal interviews may require the interviewer to make several visits to non-respondents until a participant is located and a successful interview conducted. Telephone interviewers have more flexibility in the daily time frame in which to attempt to make contact with non-respondents. Self-administered questionnaires because they are typically mailed, require a longer data collection period. The data collection period for self-administered questionnaires will be determined by the initial response to the survey and the number of planned follow-up attempts (Aday, 1996).

Data analysis, which includes editing and cleaning data, estimating missing values, and speed of turnaround, is the fifth aspect of survey research having distinct advantages and disadvantages when comparing the three traditional methods of data collection in survey research. Errors in data which may require editing include "following the wrong sequence of questions so that the wrong questions are answered or that questions are left out or have values that are much too high ... or low ... either logically or relative to other information in the questionnaire" (Aday, 1996, p. 107).

Self-administered questionnaires are more likely subject to such errors than personal or telephone interviews because item interpretation is limited by participant ability, unless it is a group administered survey. Self-administered questionnaires also are more likely to yield missing values than personal and telephone interviews because the interviewer can probe for responses (Aday, 1996).

Methods for estimating missing values can be designed. Personal interviews and self-administered questionnaires also take longer in data processing than the more centralized telephone interviews (Aday, 1996).

Cost is the sixth and final aspect of survey research having distinct advantages and disadvantages when comparing the three traditional methods of data collection in survey research. Aday (1996) reported personal interviews are more expensive than telephone interviews, with overall costs of telephone interviews, depending on the study design, half that of personal interviews. Higher data collection and sampling costs account for the difference. Interviewer salaries and travel expenses must be included in the overall costs of personal interviews. Telephone interviews and mail self-administered questionnaires do not require such costs. Self-administered mail surveys are the least expensive data collection method (Aday, 1996).

There are several factors that determine the data collection method used by a researcher, such as the research question(s) and the purpose of the study, the population, availability, and cost. If a researcher is interested in the health risk behaviors of adolescents in a low-income, predominantly Spanish-speaking community, then a personal interview with bi-lingual interviewers may be the best data collection method. However, if the population of interest is quite large and the study is being conducted as a student research project, the best data collection method may be self-administered questionnaire provided in both Spanish and English, possibly school-based. Some methods may seem suitable to the research question, but may not be feasible to the scope of the project. Cost also can be a factor if the study is constrained by a limited budget (Aday, 1996; Fowler, 1984).

Health surveys have been successfully conducted using the three traditional methods of data collection and at times researchers have found it necessary to incorporate more than one method in a single study. The National Center for Health Statistics (NCHS) is the main health survey agency for the United States (Aday, 1996; NCHS, 1998). NCHS continuously gathers data with the National Health Interview Survey (NHIS), the primary source of health information for the U.S. population. The NHIS is a cross-sectional household survey conducted by personal interviews.

Additionally, NCHS directs the National Health and Nutrition Examination Survey (NHANES). NHANES, developed in 1960 and now in its seventh cycle, was designed to evaluate the health and nutritional status of the U.S. population. NHANES data is collected with personal interviews and physical examinations (National Center for Health Statistics, 1998).

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based telephone survey for monitoring adult health behaviors and knowledge in seven health areas (alcohol use, lack of preventive services, physical inactivity, poor diet, risky sexual behaviors, tobacco use, and violence). The BRFSS was developed in 1981 to provide state-specific health risk behavior data which had been previously unavailable from NCHS. The BRFSS has been operational since 1984 and is described as the largest continuous telephone health survey in the world (National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 1998a).

The Institute for Social Research at the University of Michigan, supported by a grant for the National Institute on Drug Abuse (NIDA), conducts the Monitoring the Future Study, also known as National High School Senior Survey. The project began in 1975 with the purpose of studying changes in the beliefs, attitudes, and behaviors of American youth. Specifically, the Monitoring the Future project measures alcohol, tobacco, and marijuana, inhalant, stimulant, cocaine, and other illicit drug use (United States Department of Health and Human Services [DHHS], 1996).

The Monitoring the Future project research design is a repeated series of surveys administered to the same segment of the population. This population is given the same set of questions over a period of years to monitor the change in responses. The population includes 8th, 10th, and 12th graders, college students, and young adults 19-32 years old who initially participate in school by completing a self-administered questionnaires in their classroom (DHHS, 1996). A sample from each senior class has been followed-up bi-annually since 1976. Questionnaires are mailed to these respondents with a return, self-addressed, stamped envelope and a small monetary gift from the University of Michigan (DHHS, 1996).

Computer-Assisted Survey Research

Recently researchers successfully explored alternative data collection methods branching into various forms of computer-assisted surveys. Over the past two decades computer-assisted survey research has been explored to complement traditional survey research methodology. Computers have been incorporated into survey research for instrument design, sampling, monitoring work in the field, coding and editing, data entry and cleaning, scale and index construction, data base organization and retrieval, statistical analysis, and documentation and reporting (Kiesler and Sproull, 1986). Additionally, data collection has been influenced by the introduction and adoption of computers

(Beebe, Mika, Harrison, Anderson, & Fulkerson, 1997; de Leeuw & Nicholls, 1996; Tourangeau & Smith, 1996).

Computer surveys have increased objectivity, reliability, and cost effectiveness, easing their adoption into survey research as data collection tools (Booth-Kewley, Edwards, & Rosenfeld, 1992; de Leeuw & Nicholls, 1996; Finegan & Allen, 1994; Lautenschlager & Flaherty, 1990). Computer-assisted survey research includes computer-assisted telephone interviewing (CATI), computer-assisted personal interviewing (CAPI), computer self-administered questionnaires (CSAQ), also known as computer-assisted self interviews (CASI), and audio computer-assisted self interviewing (Audio-CASI). All forms of computer-assisted surveys are designed so questionnaire items are read from a computer screen and responses are entered directly in the computer, either by an interviewer or by a participant (de Leeuw & Nicholls, 1996).

Computer-assisted telephone interviewing (CATI) systems, developed as marketing research tools for commercial and academic purposes, were the first computer-assisted survey research technology (Aday, 1996; Beebe et al., 1997; de Leeuw & Nicholls, 1996). CATI as described by Aday (199) is a system where "the questionnaire is programmed and displayed on a terminal or microcomputer screen...interviewers call respondents, ask the question displayed on the screen, and then enter their answers into the computer via the computer keyboard" (p. 93). Today, CATI incorporates expanded functions such as random digit dialing, scheduling and monitoring interviews, and on-screen help menus for the interviewer (Aday, 1996).

Computer-assisted personal interviewing (CAPI), an adaptation of CATI, is an interview program used with portable or laptop computers. Field interviewers then take the computer to participants, whether it is at the participant's home, office, etc., to conduct the interview (Aday, 1996; Alreck & Settle, 1995; de Leeuw & Nicholls, 1996). The computer displays instrument items to the interviewer, the interviewer presents the item to the participant, and then the interviewer enters the response into the computer. Because data input is entered during the interview, minimal data entry errors occur and if they do occur they can be corrected immediately (Aday, 1996; Alreck & Settle, 1995; de Leeuw & Nicholls, 1996).

CATI and CAPI allow for "dynamic questionnaire" construction (Alreck & Settle, 1995, p. 159). The computer can be programmed to present the instrument items one at a time with unlimited branching capabilities. A CATI and CAPI dynamic questionnaire can accommodate complex branching because it is handled by the computer rather than the interviewer. "The program 'looks at' each answer as it's recorded, or looks back at the record of earlier responses, then chooses the next item based on earlier answers" (Alreck & Settle, 1995, p. 160). This type of computer programming allows the questionnaire branching to occur without the interviewer's or the respondent's awareness.

Computer self-administered questionnaires (CSAQ), or computer-assisted self-interviews (CASI), allow for participants to sit at a computer, read the questionnaire items on the monitor, and respond either by a touch-sensitive screen or with a keyboard or pad (Aday, 1996; Alreck & Settle, 1995; de Leeuw & Nicholls, 1996). Aday (1996) and Kiesler and Sproull (1986) noted that CSAQ is limited to populations who have access to computers either in their homes or offices. Kiesler and Sproull (1986) added that this methodology is limited to populations who feel comfortable with computers.

Beebe et al., (1997) and Paperney, Aono, Lehman, Hammar, & Risser (1990) noted computer self administered questionnaire are particularly advantageous when conducting survey research in younger populations. Participants in such populations are more familiar with and comfortable with computers and more readily accept computer surveys. Johnston and Walton (1995) found younger populations prefer the computer over traditional self-administered questionnaires.

The Minnesota Student Survey Mode Effects Experiment compared computerized SAQs with paper-and-pencil SAQs for collecting sensitive behavioral information, such as drug use (Beebe et al., 1997). The study sampled students in alternative schools and area learning centers (n=368; 190 computer; 178 paper-pencil). Both instruments were based on the Minnesota Student Survey, an anonymous paper and pencil SAQ completed in the public school classrooms with a teacher present (Beebe et al., 1997).

Beebe, Harrison, McRae, Anderson, & Fulkerson (1998) found students were more likely to report various types of sensitive information in the paper and pencil SAQ than in the computer version. These results contradict many findings that CASI or CSAQ foster a sense of privacy resulting in greater honesty, and more accurate reporting of sensitive behaviors (Tourganeau & Smith, 1996). Beebe et al., (1998) concluded their study design which relied on school computer laboratories where computers and students were placed particularly close to each other may have influenced their findings.

Audio computer-assisted self interviewing (Audio-CASI), an extension of CSAQ and CASI, "allows respondents to listen over headphones to spoken questions that have been digitally recorded and stored on a laptop computer. To answer, respondents press numbered keys on the computer keyboard" (Turner et al., 1998, p. 867). An additional feature of audio-CASI is survey items are displayed on the computer screen, and "respondents may respond to the visual presentation of the question rather than waiting until the audio reading has been completed" (Turner et al., 1998, p. 867).

Audio-CASI technology is particularly useful for interviewing special populations (Aday, 1996; Turner et al., 1998). For example, audio-CASI allows for participants with varying levels of education and literacy to participate (Turner et al., 1998). Audio-CASI, like other forms of computer-assisted survey research, provides a standardized measurement system, "every respondent...hears the same question asked in exactly the same way" (Turner et al., 1998, p. 867).

Turner et al. (1998) incorporated audio-CASI into the 1995 National Survey of Adolescent Males (NSAM). The NSAM is designed to measure health risk behaviors among adolescent males such as HIV-risk behaviors, drug use, and interpersonal violence. The 1995 NSAM had two stages. The first stage was an interviewer-administered questionnaire, and stage two was a randomized experiment to assess the effect of audio-CASI technology on the measurement of sensitive behaviors (Turner et al., 1998).

All participants (n=1,729 adolescent males) completed an interviewer-administered survey about peer relationships, sources of sexuality and contraception information, their heterosexual and contraceptive experiences, knowledge of sexually transmitted diseases, and demographic characteristics. Of the original sample, 1,690 participated in stage two of the study and completed a self-administered questionnaire on sensitive topics (same-gender sex, drug use, and violent behaviors). The 1,690 participants in stage two were randomly assigned to audio-CASI version of the SAQ or a paper and pencil SAQ.

Turner et al. (1998) found participants in the audio-CASI mode were less likely to answer "don't know" or "refuse to answer" than participants completing the self-administered questionnaire. This same study also found little difference between mode of survey administration, audio-CASI or SAQ, and estimates of the prevalence of male-female sexual contacts. The only significant effect found between mode of administration and prevalence estimates of male-female sexual contact was sex with a prostitute, with participants 3.6 times as likely to report such contact (Turner et al., 1998).

However, Turner et al. (1998) did find increased reporting of same-gender sex, with participants four times as likely to report same-gender sexual contact with audio-CASI compared with traditional SAQ. These findings are consistent with prevalence estimates (~4 to 9%) derived from retrospective studies of adult males reporting same-gender sexual contact during adolescence (Turner, et al., 1998).

Additionally the 1995 NSAM study focused on drug-related behaviors associated with HIV transmission such as intravenous drug use and use of crack cocaine. Prevalence estimates of intravenous drug use and sexual contact with intravenous drug users were higher with audio-CASI than with paper SAQ. Audio-CASI results yielded prevalence estimates at 5.2% compared with 1.4% for paper SAQ. This prevalence estimate is significantly higher than any previous population estimate (Turner et al., 1998).

Turner et al. (1998) found audio-CASI technology to have a significant effect on the reporting of sensitive behavior, concluding that audio-CASI technology yields more accurate measurement of health risk behaviors and that adolescent males are encountering greater health risk than previously assumed.

Once computer hardware is purchased, computer-assisted survey research has a potentially lower cost compared to the traditional data collection methods (Beebe et al., 1997; Kiesler & Sproull, 1986). Additionally, in follow-up surveys, participants reported computer questionnaires to be more interesting, more important, and to create a sense of privacy, legitimacy, and scientific value (Booth-Kewley, Edwards, & Rosenfeld, 1992; Tourangeau & Smith, 1996). Overall, participants tend to prefer both CASI and audio-CASI over traditional paper-and-pencil self-administered questionnaires (O'Reilly, Hubbard, Lessler, Blemer, & Turner, 1994).

Computers have developed and maintained their presence in health care since the 1960s beginning with clinical techniques and office management evolving into computerized decision making and computer-assisted testing, to contemporary computer-assisted survey research activities (Skinner & Allen, 1983). As Aday (1996) contends

> the design and conduct of health surveys in the future will...be shaped by changes in the diversity, complexity, and sensitivity of the topics addressed... the innovative techniques and technologies that are being developed for carrying them out, and the new or intensified ethical dilemmas that are a result of these changes. (p. 2)

Internet-Based Survey Research

The Department of Defense's Advanced Research Projects Agency (ARPA) funded the development of the Internet in the late 1960s. The research focused on "creating a packet-switched network in which information is divided into small packets that travel independently over whatever networks happen to be open. The result was the Transmission Control Protocol-Internet Protocol (TCP-IP)" (Starr, 1997, p. 8). This technology allows for communication across computer networks. In 1969, ARPANET went online, connected four universities, and by 1983 became known as the ARPA Internet. The ARPA Internet was divided into two distinct networks, the military network, MILNET, and the research network, ARPANET (Starr, 1997). In 1986, the National Science Foundation, also involved in the development of the Internet, linked its supercomputers (NSFNET) to ARPANET. Universities and businesses quickly established similar networks, such as USENET, BITNET, and CSNET (Starr, 1997). Services provided on the networks included E-mail, file transfer protocol (FTP), and remote log-in (TELNET).

Today, the Internet is a global network connecting tens of thousands of computer networks and has been described as "the set of all connected computers that are networked using the TCP/IP protocol and who have assigned IP numbers and fully-qualified domain names" (Santoro, 1994, p. 75).

As interest in the information available on the Internet increased, the need for an organizing structure was recognized. Organizational attempts included "such animals" as gopher and veronica eventually evolving to what is now the hypertext markup language-based (HTML) World Wide Web (Vanouplines & Nieuwenhuysen, 1996, p. 368).

Starr (1997) aptly describes the World Wide Web as "one of several services on the Internet, easily the most glamorous, and largely responsible for the tremendous increase in Internet users" (p. 7). Specifically, the World Wide Web (Web) is an Internet application based on hypertext, or HTML. The Web is capable of supporting not only text documents, but also graphics, sound, videos, databases, and three dimensional moving objects (December, 1994; Gauger, 1994; Santoro, 1994). The Web is connected to the Internet, but does not allow users to access all aspects of the Internet (Lomarcan, 1995). Vanouplines and Nieuwenhuysen (1996) noted "the World Wide Web is evolving from a collection of texts linked by hypertext and hypermedia towards services that operate interactively with the information user" (p. 367).

Both the Internet and Web have been involved with advancing survey research. The Internet's E-mail capability has been used in survey research since the 1970s, yet few studies have examined its effectiveness as a tool for data collection. Of the studies conducted, most compared mailed, self-administered questionnaires, personal interviews, and E-mail surveys for differences in response rates and response effects (Good, 1997; Kiesler & Sproull, 1986). Even fewer studies have been conducted to determine the feasibility of using Web-based surveys as a tool for data collection, yet design elements and technology for this method demonstrate potential for survey researchers.

Electronic Mail Survey Research

Electronic mail (E-mail) is a feature of the Internet which allows users to exchange messages, usually text, sent from one person to another via the computer (Kittleson, 1995; Taulois-Braga & Marcenes, 1995). E-mail, an original Internet service, has been part of the survey research community for nearly 20 years, yet little research has been conducted on the feasibility of the technology as a tool for data collection (Kiesler & Sproull, 1986). Thatch (1995) defines E-mail survey research as "the systematic data collection of information on a specific topic using computer questionnaires delivered to an online sample or population. Respondents receive, complete, and return their questionnaire via E-mail" (p. 27). Early enthusiasts predicted E-mail surveys may produce higher response rates at a lower cost than either self-administered questionnaires or personal interviews (Sproull, 1986).

Kiesler and Sproull (1986) compared the differences of response effects associated with E-mail surveys versus traditional self-administered surveys. Specifically they studied the item completion rate and item completion errors, and the number of sensitive questions answered, anticipating participants would admit to more socially undesirable behaviors on the E-mail survey than with the traditional self-administered survey. The instrument used was an 18-item questionnaire on health attitudes, behaviors, and personal characteristics (Kiesler & Sproull, 1986).

Kiesler and Sproull (1986) found a higher response rate for the traditional self-administered survey (75%) compared to the E-mail survey (67%), but the E-mail survey had a faster response time (9.6 days) than the traditional self-administered survey (10.8

days). Additionally, E-mail surveys suffered from fewer item completion errors than the self-administered paper survey. And finally, E-mail survey participants gave less socially desirable responses and more extreme responses than the traditional self-administered survey group (Kiesler & Sproull, 1986).

Parker (1992) conducted a E-mail survey, as part of the Process Quality Management and Improvement (PQMI) team at AT&T, to examine the expatriation and repatriation processes. The PQMI team developed an E-mail questionnaire to solicit responses from employees who were located all around the world. The target population for the study included 140 members, 100 of which had E-mail address and 40 who did not. The 100 members of the population with E-mail addresses received a 32-item questionnaire via E-mail, the remaining 40 received the identical instrument in the traditional paper-and-pencil self-administered format via company mail (Parker, 1992).

Response rate for the E-mail survey was 68% compared to only 38% (15 instruments returned) for the mailed, self-administered format (Parker, 1992). Of the 68% of participants returning the E-mail survey, 28% chose to print the E-mail questionnaire and returned paper copies of questionnaire via the mail. Parker (1992) considered this a response to the electronic survey.

Parker (1992) concluded the significant difference in response rate may be accounted for in the medium. E-mail, at the time of her reporting, did not deliver "a disagreeable volume of junk mail" (p.54) and did not use many E-mail questionnaires. She also attributed the E-mail survey's higher response rate to newness or novelty. She stated "there is a mystique in high tech, in computers, and in digitization of written words. It has to do with being part of the cutting edge in electronics" (Parker, 1992, p. 54).

Schuldt and Totten (1994) compared an E-mail survey (n_1) response rate to the response rate of a mail, self-administered survey (n_2). The sample size was 543 (n_1=343; n_2=200) and was a simple random sample of all marketing information sciences, computer information sciences (MIS/CIS) and marketing faculty at U. S. colleges and universities. The E-mail survey yielded a usable response rate of 19.3%, with 125 returned undeliverable. Researchers received 113 completed, mailed, self-administered surveys, yielding a response rate of 56.5% (Schuldt & Totten, 1994).

Schuldt and Totten (1994) reported E-mail surveys were initially returned at a faster rate, with an early return ratio of 9:1. However, within six days this return ratio shifted from 9:1 to .34:1. The researchers tested the cumulative response distributions using a two-sampled, one-tailed Kolmogorov-Smirnov test and found the difference to be statistically significant (Schuldt & Totten, 1994). The response rates, averaged over a 36-day period, were 3.14 for the mailed, self-administered survey and 1.17 for the E-mail survey. To examine the difference between the response rates, an independent (two-tailed) *t-test* was calculated and not found to be significant (*p-value* =.1885) (Schuldt & Totten, 1994).

Schuldt and Totten (1994) stated they were "pleased with the high response rate for a one-time, low-budget mail survey...[and] disappointed, but not very surprised, in the low response rate for electronic mail" (p. 38). Most of the E-mail participants were MIS/CIS professors who were more likely to be regular users of E-mail and more comfortable with the technology. They concluded that marketing professors in their sample did not use E-mail as often as anticipated or perhaps they were not as comfortable with computers and the technology (Schuldt & Totten, 1994).

Kittleson (1995) also conducted a study to compare the response rate between E-mail surveys and mailed, self-administered questionnaires. The sample used was 153 public health officials and university faculty in health education and public health who requested to be listed in the International E-Mail Directory for Health Educators. The instruments used in this study were not identical. The mailed self-administered survey was a postcard which solicited information regarding participant involvement in professional conferences. The E-mail survey requested information regarding professional health education journals to which participants subscribed (Kittleson, 1995).

Participants received both the mailed, self-administered survey/postcard and the E-mail survey. The mailed, self-administered survey yielded a usable response rate of 76.5%, whereas the E-mail survey only had a response rate of 28.1%, concluding that participants were three times more likely to complete and return the mailed, self-administered postcard than the E-mailed survey (Kittleson, 1995). Like Schuldt and Totten (1994), Kittleson (1995) reported an initial faster return rate but one that abruptly stops after the first couple of days, suggesting a need for reminder messages within a few days of the initial mailout.

In 1997, Kittleson conducted another E-mail survey to determine the optimal number of reminder or follow-up messages to receive the highest response rate when conducting an E-mail survey. Subjects in this study again were professionals listed in the

International E-Mail Directory for Health Educators (IEMDHE), membership at the time of this study was 276 (Kittleson, 1997).

The study design was quasi-experimental, with members of the IEMDHE randomly assigned to one of four groups: Group 1/no follow-up; Group 2/1 follow-up; Group 3/2 follow-ups; Group 4/ 4 follow-ups. Participants received a questionnaire that requested certifications they currently held or held in the past (Kittleson, 1997).

The overall survey response rate was 47.5%, almost double the previous study. Chi-square analysis showed a significant difference among the four groups (χ^2_{3df}= 15.68, p-value = .0013). Post hoc analysis was conducted and revealed significant differences between Group 1 and Group 2 (.0031), Group 1 and Group 3 (.0006) and Group 1 and Group 4 (.0018) (Kittleson, 1997). There were no significant differences found between Group 2 and Group 3, Group, 2 and Group 4, and Group 3 and Group 4. These results suggest that 1, 2, or 4 follow-up reminders will increase response rate.

Kittleson (1997) stated four possible reasons for the study's low response rate in spite of the follow-ups. First, some E-mail systems purge messages after a certain number of days, even if the mail has been unopened. Second, like mailed surveys, E-mail surveys can be opened and if not completed immediately may be forgotten. Unlike mail surveys which may be shuffled on a desk, E-mail surveys are virtually shuffled and easier to misplace. Third, the IEMDHE directory members may not be regular E-mail users or uncomfortable with the technology. Kittleson (1997) received four surveys where participants had printed the E-mail survey, completed, and returned via the U.S. mail. These participants commented they were happy to participate in the survey but were unsure of the technology. And finally, E-mail is not anonymous and may be a deterrent to some participants (Kittleson, 1997).

Good (1997) also examined factors affecting response rate in E-mail surveys and found that one follow-up doubled the response rate from 26.1% (no follow-up) to 51.2% (follow-up). She also found participants who received a pre-notification message and follow-up to have a higher response rate (60.8% to 28.8%). Similarly, the personalized follow-up group had a response rate of 57.7%, compared to the nonpersonalized follow-up group with a response rate of 25.4%. Good (1997) concluded that the variable most influencing E-mail response rate was use of a follow-up message.

Additional E-mail health surveys have been conducted including Taulois-Braga and Marcenes (1995) study of dental public health and Alexander and Trissel's (1996) study on chronic prostatitis. Taulois-Braga and Marcenes (1995) studied knowledge and attitudes towards sugar among Brazilian postgraduate students living the United Kingdom and Brazil. The instrument was E-mailed to 270 students, and 130 were completed and returned yielding a response rate 48% (Taulois-Braga & Marcenes, 1995).

Taulois-Braga and Marcenes (1995) concluded that E-mail was a valuable tool for collecting data in dental public health with the main advantages including speed, low cost, practicability, unlimited geographical coverage, and researcher's ability to respond to participants questions quickly and probe participants beyond a given answer. Taulois-Braga and Marcenes (1995) noted that E-mail survey research is not appropriate for studies requiring representative samples.

Alexander and Trissel (1996) attempted to define and catalog symptoms of prostatitis, examine potential etiologic factors in prostatitis patients, and determine the feasibility of conducting survey research using E-mail. They developed a 54-item questionnaire about symptoms and potential etiologic factors regarding chronic prostatitis. The instrument was posted to topic-specific Internet news groups and general medical newsgroups. Anyone with a history of prostatitis was invited to respond either by E-mail or print the survey, complete manually, and return by U.S. postal mail (Alexander & Trissel, 1996).

Within two months (55 days), 163 completed surveys were returned, and only 16 (9.8%) had one or more invalid answers or item completion errors. Alexander and Trissel (1996) carefully noted the shortcomings of the study included the population of respondents may not be representative of the general population of men with prostatitis and the demographics of participants reflects the population with access to a computer and E-mail and not necessarily the general population of men or the general population of men with prostatitis. Alexander and Trissel (1996) identified advantages to using E-mail surveys and included speed with which data can be collected from large numbers of participants, and they believed the sense of privacy and anonymity of E-mail facilitated the thorough answering of sensitive items.

Overall, researchers have identified several advantages to E-mail surveys: (1) it overcomes time zone problems; (2) reduces the amount of paper participants must encounter on a day-to-day basis, in general, and paper questionnaires in particular; (3) it is faster; (4) it is cost effective; and (5) it is flexible (Mehta, 1995; Parker, 1992; Schuldt

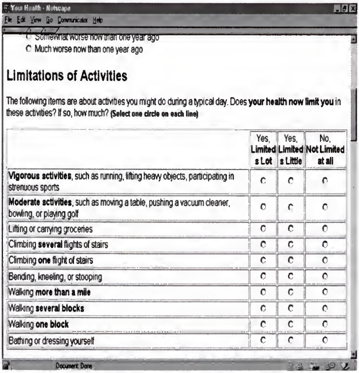
& Totten, 1994; Thatch, 1995). The disadvantages or constraints associated with E-mail survey research include: (1) participants must be E-mail subscribers, (2) target population must be finite, (3) computer system or computer program compatibility is a requirement, (4) computer configuration may limit survey size, (5) participants must be comfortable with computers and E-mail technology, and (6) truly anonymous responses are not possible (Goree & Marszalek, 1995; Mehta, 1995; Parker, 1992; Schuldt & Totten, 1994; Thatch, 1995).

Web-based Survey Research

The World Wide Web (Web) has traditionally been used by researchers to present and exchange research data, rather than for collecting data (Soetikno, Mrad, Pao, & Lenert, 1997). Although, the Web has numerous on-line surveys, these surveys are more likely collecting Web demographics rather than examining the effectiveness of the Web as a method for collecting data. However, the Web recently has been recognized for providing access to a growing and widespread population of research participants (Houston & Fiore, 1998). Likewise, the Web is now recognized as an important medium not only education and collaboration, but also for conducting research (Bell & Kahn, 1996).

Almost any survey instrument that can be developed for mail, self-administration can be developed and posted for Web administration (Hewson, Laurent, & Vogel, 1996). Hypertext Markup Language, or HTML, is the language of the Web "introduced support for interactive documents, termed "forms," that provided the first practical mechanism for administering surveys" (Houston & Fiore, 1998, p. 117). Form elements include check boxes, radio buttons, and text-entry boxes combined with a point and click interface. Survey participants can "complete forms that are visually and functionally identical to conventional questionnaires" (Houston & Fiore, 1998, p. 117).

Bell and Kahn (1996) explored use of a Web-based survey to collect health status information. The RAND 36-item Health Survey 1.0 (RAND-36) was converted to HTML for Web administration. The Web-based instrument included 36 multiple choice items,



○ Somewhat worse now than one year ago
○ Much worse now than one year ago

Limitations of Activities

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much? **(Select one circle on each line)**

	Yes, **Limited a Lot**	Yes, **Limited a Little**	No, **Not Limited at all**
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	○	○	○
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○	○	○
Lifting or carrying groceries	○	○	○
Climbing **several** flights of stairs	○	○	○
Climbing **one** flight of stairs	○	○	○
Bending, kneeling, or stooping	○	○	○
Walking **more than a mile**	○	○	○
Walking **several blocks**	○	○	○
Walking **one block**	○	○	○
Bathing or dressing yourself	○	○	○

Figure 1. A screen capture of the Rand-36 as it was developed and presented in tabular format for Web-based administration (Bell & Kahn, 1996).

each item is worded exactly as the traditional form and likewise appears in bold face type (Bell & Kahn, 1996). Two Web versions of the instrument were developed. The plain version listed response options below the question. The table version of the instrument presented the items and response options in a more compact format (Figure 1).

Participants were passively recruited through announcements of survey availability by postings on health electronic mailing lists, USENET groups, the NCSA, Netscape's What's New? Service, and Yahoo's General Health Web Index (Bell & Kahn, 1996). A total of 4,876 usable surveys were received. Of those responding, 2,455 were men (50.3%) aged 18 to 97 with a mean age of 38.2 and 2,421 were women (49.7%) aged 18 to 87 years with a mean age of 34.8 (Bell & Kahn, 1996). The majority of participants (87.7%) answered the instrument completely; with an overall item completion rate of 99.28% (Bell & Kahn, 1996). Ninety-seven percent of participants completed the instrument in less than ten minutes.

Bell and Kahn (1996) reported values of Cronbach's alpha of 0.76 to 0.90 for the scored scales. These values show a high degree of internal consistency and are similar to results found in the more traditional Medical Outcomes Study. This self-selected population reported better health, specifically better physical health, than participants in the Medical Outcomes Study. Bell & Kahn (1996) demonstrated that Web-based surveys can be used to collect personal health status information, and "that 97% of users completed the survey in less than 10 minutes attests to the ease of use" (p. 341).

Borer, Hebert, and Breshears (1996) conducted a Web-based survey to determine the actual size of the refractive surgery market in the United States. This study did not use sampling and relied on participants self-selecting. The Web-based survey was advertised to interested news groups across the United States. Participants were asked to visit the Web-based survey and received a nominal fee of $2.

The 13-item survey was completed by 322 participants. In addition to 13-items focused on refractive surgery and factors involved in the decision to have such surgery (i.e. cost, preferred procedure refractive keratectomy [RK] or Photorefractive keratectomy [PRK], refractive error) participants were asked to provide demographic information (Borer, Hebert, & Breshears, 1996).

Borer, Hebert, and Breshears (1996) conducted this survey prior to approval of PRK. Earlier studies had shown, however, that patients eligible for PRK surgery were waiting for Food and Drug Administration approval and would select PRK over RK once PRK was approved, and PRK surgery costs would be approximately $1500 to $2000 per eye . Results of the Web-based survey showed the number of patients willing to have PRK and the price they were willing to pay for the surgery was far less than originally predicted.

Stones and Perry (1997) explored the feasibility of soliciting data from sufferers of panic attacks using a Web-based survey. Additionally, they compared their results with findings obtained using traditional survey research methods (Stones & Perry, 1997). No sampling was conducted, rather the questionnaire was posted on the Web and the URL was submitted to search engines and major mental health Web sites, with the intent that persons interested in the topic would locate and visit the survey.

Stones and Perry (1997) reported that within five weeks over 300 responses to the questionnaire had been received, and this response rate was maintained over the first 6 months of the posting (or at the time of the publication). Also reported is that for every 5 hits to the Web site three survey responses were submitted. Of the 300 respondents 64.2% were female and 35.8% male. Data collected from the Web-based survey were similar to findings in clinical studies (Stones & Perry, 1997).

Soetikno, Provenzale, and Lenert (1997) also developed an open-enrollment Web-based survey to explore the feasibility and methodology of a longitudinal outcomes study of Internet users who have ulcerative colitis. Participants were recruited by posting survey announcements and links on the home pages of gastrointestinal research groups, university-based gastrointestinal units, and the Crohns Colitis Foundation (Soetikno, Provenzale, & Lenert, 1997). The survey Web site asked that only persons with ulcerative colitis provide information regarding their willingness to participate in a longitudinal quality of life study, desire for reimbursement for study participation, willingness to release medical records, demographic data, and stability of E-mail addresses (Soetikno, Provenzale, & Lenert, 1997).

Within two months, 582 users accessed the Web site and approximately 30% completed the questionnaire. Of the 170 (30%) participants, 165 agreed to participate in a longitudinal preference-assessment study designed to measure preferences on quality of life, 21% indicated they would like to be reimbursed for their participation, 84% indicated they would be willing to release their medical records, and 70% had the same

E-mail address over 2 years suggesting that long term follow-up could be practical (Soetikno, Provenzale, & Lenert, 1997).

In a follow-up study, Soetikno, Mrad, Pao, and Lenert (1997) recruited 53 of the 165 participants who agreed to participate in the longitudinal study to complete a series of Web-based surveys. The 53 participants recruited for the Web-based survey were patients who had previously identified themselves as having undergone a colectomy with ileal pouch-anal anastomosis (CIPAA), the most widely used surgery for the treatment of ulcerative colitis (Soetikno, Mrad, Pao, & Lenert, 1997). The participants were asked to complete a Web-based SF-36 Health Assessment Questionnaire (SF-36), and a Web-based Self-Administered Inflammatory Bowel Disease Questionnaire (IBDQ). After completing the two questionnaires participants also were asked to rate their quality of life on an animated visual analog scale (VAS) and the Standard Reference Gamble, where participants "used an animated graphic to identify the maximum risk of death they would be willing to take to trade their current health for "perfect" health" (Soetikno, Mrad, Pao, & Lenert, 1997, p. 429).

Of the 53 CIPAA participants in the Web-based survey group, 52 completed both the SF-36 and IBDQ, yielding a response rate of 98%. Item completion rates for the SF-36 and the IBDQ were very high for an instrument with more than 80 multiple-choice questions. A decline in completion rates (79%) was witnessed for the VAS and Standard Gamble which followed the questionnaire items. Soetikno, Mrad, Pao, and Lenert (1997) noted this most likely was due to fatigue and the difficulty in the task required by participants. This part of the survey also involved advanced technology (such as frames and sound) which may have exceeded the computer capabilities of the participants (Soetikno, Mrad, Pao, & Lenert, 1997).

Soetikno, Mrad, Pao, and Lenert (1997) also formed a comparison group. For the comparison, 47 post-CIPAA participants were recruited from a single surgical practice. Participants in this group were asked to visit the researchers' office to be interviewed. All 47 participants in the comparison groups completed the SF-36 and IBDQ, and 46 of 47 completed the VAS and the Standard Gamble (Soetikno, Mrad, Pao, and Lenert, 1997).

Soetikno, Mrad, Pao, and Lenert (1997) concluded that it is feasible to conduct quality of life research using Web-based surveys because patients with ulcerative colitis are interested in participating in on-line research. Soetikno, Mrad, Pao, and Lenert (1997) compared the Web-based survey data collected with a comparison group and noted that while there were demographic differences between the two groups the differences did not explain the measured differences in quality of life.

Wu (1997), in a study conducted at the George Washington University, assessed the usefulness of the Web as a survey medium compared to self-administered surveys. The researcher converted a paper-and-pencil course evaluation instrument to a Web-based survey. Differences in response rate and response quality between the Web-based survey and previously collected paper-and-pencil survey data were compared. Additionally, Wu (1997) examined the impact of a social cue indicating friendliness on Web-based surveys.

Two versions of the survey were placed on the Web (one with a social cue indicating friendliness in the interface, and one without). The social cues presence on the Web survey varied throughout the day.

The study population was students enrolled in any Electrical Engineering and Computer Science (EECS) course at the George Washington University. Students were informed about the new Web-based course evaluation through E-mail messages, school computer Message of the Day, a link on the University's Home page, and flyer's strategically placed around campus (Wu, 1997). Additionally, EECS faculty were notified about the Web-based survey.

Of the total number of registered students in the EECS classes ($\underline{N}$=3073), 588 (19.1%) valid Web-based surveys were received. Of the 588, 262 (45%) completed a Web-based survey with a social cue indicating friendliness and 326 (55%) completed a Web-based survey without a social cue indicating friendliness (Wu, 1997).

Wu (1997) conducted a z-test to compare the difference in response rate with the Web-based survey and the historical data on the traditional paper-and-pencil course evaluations. She did not find evidence to conclude the response rate for Web-based surveys was better than the response rate for paper-and-pencil surveys ($z=8.35$, $\alpha=.05$). In terms of response quality (measured by open-ended comments completion rate and average number of words for comments), she found there were significantly more comments for Web surveys than the paper-and-pencil survey ($z=11.49$, $\alpha=.05$), and the average number of words for Web surveys was significantly greater than the paper-and-pencil survey ($t=2.35$, $\alpha=.05$) (Wu, 1997). All hypothesis tests for the survey methods with the social cue were not statistically significant, yet they did yield better response quality, higher item completion rates, more comments submitted, and more words per comment (Wu, 1997).

Overall Wu (1997) found a lower response rate for Web-based surveys compared to a traditional paper-and-pencil survey, better response quality with Web-based surveys compared to traditional paper-and-pencil surveys, and a social cue in the computer interface to have a significant impact on response quality. Wu (1997) recommended further research on Web-based surveys focus on using random selection and random assignment, where a random sample is drawn and participants are randomly assigned to a Web-based survey group or a self-administered questionnaire group. Additionally, recommendations included exploring alternatives to Web-based survey promotion to increase response rate (Wu, 1997).

Preliminary research has demonstrated a low response rate for Web-based surveys and several recommendations have been made to overcome this problem (Houston & Fiore, 1998; Gaddis, 1998; Kiernan, 1998; Wu, 1997). For example, the use of incentives or promotional tie-ins have been recommended (Gaddis, 1998; Kiernan, 1998). Incentive suggestions include on-line coupons, small gifts, and random selection of participants to win prizes (Gaddis, 1998; Kiernan, 1998; Soetikno, Mrad, Pao, & Lenert, 1997)

Soetikno, Mrad, Pao, and Lenert (1997) used the choice of a small gift as an incentive, as did the National Aeronautics and Space Administration (NASA) at their Web site. Every 100th visitor to the NASA Web site was asked to complete a brief survey concerning the user's personal characteristics and educational background. As compensation for completing the Web-based survey participants were offered a Hubble picture suitable for framing. Of those participants who were asked to complete the Web-based survey, 70% agreed, a higher response rate than previously cited Web-based surveys (Kiernan, 1998). Additionally, Web-based surveys can be programmed to provide instantaneous and personalized feedback to participants possibly serving as a motivator or incentive to potential participants (Schmidt, 1997).

Review of the Web-based survey research that has been conducted and reported reveals distinct disadvantages and advantages with this methodology when compared to the traditional survey research methods.

Soetikno, Provenzale, & Lenert (1997) stated Web-based survey research "represents a trade-off between easy, low cost access to large numbers of patients [participants] and the representativeness in the population studied" (p. 459). Schmidt (1997) further described the problem as "the age-old sampling problem (concerning the degree of fit between a survey sample and the target population about which generalizations are to be made) [also] exists for Web surveying" (p.274).

Caution is warranted in the validity of Web-based survey results. Demographic differences between Web users and the general United States population exists, and are likely to be skewed toward a younger, more educated, and male population. Nearly forty percent of Web users (39%) are between the ages of 18 and 34 and over seventy-five percent (77%) are between the ages of 18 and 49. The majority of Web users also are male (56%) and educated, with more than 51% of all Web users having earned a college degree. These numbers are higher when compared to the U.S. population where only 30% are between the ages of 18 and 34, 48% male, and only 24% have earned a college degree (RelevantKnowledge®, 1998; Turner & Turner, 1998). Hewson, Laurent, and Vogel (1996) also are careful to include that the "general connectivity among private users seems to select for people with a certain amount of interest in (or at least minimal fear of) technology" (p.186).

However, Web demographics, are increasing in diversity which "increases availability of samples whose diversity approximates that of the entire population, and it also makes distinct groups directly accessible for research specific to group definitions" (Hewson, Laurent, & Vogel, 1996, p. 186). Until such a time as Web users are representative of the entire population, Schmidt (1997) recommends targeting specific populations to increase the validity of Web survey research.

Additional disadvantages of Web-based surveys include problems of instrument design. Participants may enter unacceptable responses such as text entered where numerical values are requested (Schmidt, 1997). Also, multiple submissions (whether due to error or intent) of a survey can cause problems. A well-written common gateway interface (CGI) program, however, can detect and delete multiple submissions (Schmidt, 1997). It also may be helpful to post next to the "submit survey now" button a note to only click once. The Windows system has conditioned computer users to double-click the mouse to engage an action, whereas Web hypertext does not require double-clicking of the mouse to make connections.

Incomplete survey submissions also are a disadvantage, but one that raises ethical concerns. CGI programs can be written to return to participants any survey items not completed thus ensuring complete survey submissions (Schmidt, 1997). However, appropriate informed consent processes clarify survey participation is voluntary, participants are not required to answer any items they do wish to answer, and may terminate their participation at any time. Incomplete form submissions, like incomplete self-administered questionnaires is not easily resolved.

While suffering from many of the same problems as traditional self-administered questionnaires, Web-based surveys have distinct advantages. Web-based survey are inexpensive to design and place on the Web. Web-based surveys remove the need for paper resources, save money because they do not require printing costs like mailed, self-administered questionnaire, and do require distribution and collection costs such as envelopes and postage.

Survey software and Internet access are the primary costs associated, but also may be avoided (Gaddis, 1998; Schmidt, 1997). Researchers may avoid these costs if they learn the appropriate language to program the Web-based survey or if the researcher is affiliated with an institution which has unlimited access to the Internet and a Web server. Although this may be seen as an expense itself, the survey cost and Internet access are minimal compared to the costs associated with a mailed, self-administered questionnaire.

Time also can be saved with Web-based surveys. Instrument development and distribution requires less time. Response time for Web-based surveys also is decreased (Gaddis, 1998; Hewson, Laurent, & Vogel, 1996; Schmidt, 1997). Like E-mail surveys, participants in Web-based surveys can complete the instrument at their convenience and pace (Hewson, Laurent, & Vogel, 1996; Houston & Fiore, 1998). Because participants complete a Web-based survey at their leisure they may be more likely to disclose sensitive information. Houston and Fiore (1998) speculate participants also may be more willing to answer sensitive questions due to an increased perception of anonymity.

Data entry also benefits with Web-based surveys. Researcher data entry is eliminated because this task is now completed by survey participants. Data is collected instantaneously and effortlessly, and can be programmed to automatically be added to a data base (Houston & Fiore, 1998; Schmidt, 1997; Turner & Turner, 1998).

Understanding and controlling for the distinct advantages and disadvantages of Web-based surveys is necessary prior to beginning research with this technology. Additionally, combining Web design techniques with traditional survey research designs can improve the quality of Web-based surveys and the quality of data returned (Gaddis, 1998).

Health Risk Behavior Surveillance Systems

The National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), a division of the Centers for Disease Control and Prevention (CDC), in an attempt to enable "an increasingly diverse society to lead long, healthy, satisfying lives," (p.1) developed a four-fold mission. Their mission is aimed to: (1) prevent death and disability from chronic diseases, (2) promote maternal, infant, and adolescent health,

(3) promote healthy personal behaviors, and (4) develop partnerships with health and education agencies, major voluntary associations, the private sector, and other federal agencies to accomplish the mission (NCCDPHP, 1998a).

The NCCDPHP in an effort to accomplish their mission developed four surveillance systems. A surveillance system is the ongoing and systematic collection, analysis, and interpretation of data for the purpose of describing and monitoring health (Klaucke et al., 1988). The information gained is used to plan, implement, and evaluate health interventions and programs. Surveillance data may be used for needs assessment and for program evaluation (Klaucke et al., 1988). The four systems developed by the NCCDPHP are the Behavioral Risk Factor Surveillance System, Maternal and Infant Health Surveillance System, Cancer Surveillance, and the Youth Risk Behavior Surveillance System.

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based telephone survey for monitoring adult health behaviors and knowledge in seven health areas (alcohol use, lack of preventive services, physical inactivity, poor diet, risky sexual behaviors, tobacco use, and violence). The BRFSS has been operational for 15 years and is described as the largest continuous telephone health survey in the world. This surveillance system allows public health officials to make state-to-state comparisons as well as state-to-nation comparisons (National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 1998a).

The maternal and infant health surveillance system is officially called the Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS is a population-based surveillance system that monitors selected maternal attitudes, behaviors, and experiences. The goal of PRAMS is to improve the health of mothers and infants by reducing adverse pregnancy outcomes such as low birth weight, infant mortality and morbidity, and maternal morbidity (NCCDPHP, 1998b).

The cancer surveillance system, the National Program of Cancer Registries was authorized by the United States Congress in 1993. This national program serves as the foundation for a comprehensive cancer prevention strategy and supports statewide cancer registries that monitor local cancer trends, incidence, and mortality. This program also advises states in planning, implementing, and evaluating cancer programs and has an important role in health resource allocation (NCCDPHP, 1998c).

The Youth Risk Behavior Surveillance System (YRBSS) monitors six categories of priority health-risk behaviors among youth and young adults. The YRBSS includes a) national, state, and local school-based surveys of high school students conducted biennially since 1991, b) a household-based survey conducted in 1992 among a national sample of youth aged 12-21 years, and c) the national college-based survey --the National College Health Risk Behavior Survey (NCHRBS) conducted in 1995 (DASH, 1997).

The National College Health Risk Behavior Survey

The 1995 National College Health Risk Behavior Survey (NCHRBS) was a national college-based survey developed by the Centers for Disease Control and Prevention (CDC) and the National Center for Chronic Disease Prevention and Health

Promotion (NCCDPHP) to describe the prevalence of health risk behaviors among college students.

Before 1995 NCHRBS, little was known about the health and health risk behaviors of college students. Prior studies focused on only one or two health risk behaviors and sampled from one college or university (DASH, 1997; Douglas et al., 1997). Only four studies had examined the health risk behaviors of a national sample of students enrolled at a college or university: Monitoring the Future Study, the Core Alcohol and Drug Survey, the Sexual Experience Survey, and an unnamed binge drinking study (DHHS, 1996; Douglas et al., 1997).

The Monitoring the Future Study, as described before is a longitudinal study that by design measures the use and abuse of substances on college and university campuses. The substances studied are tobacco, alcohol, marijuana, inhalant, stimulant, cocaine, and other illicit drug use (DHHS, 1996). The Core Alcohol and Drug Survey also examined substance use and abuse on college and university campuses from 78 institutions from 1989 to 1991. The Sexual Experiences Survey examined sexual aggression and victimization from a national sample of colleges and universities in 1984 and 1985 (Douglas et al., 1997). Lastly, in 1993 the unnamed binge drinking study "examined the nature and extent of binge drinking among a national sample of students in 4-year colleges and universities" (Douglas et al., 1997, p. 55). Results from the studies and the general lack of health risk behavior survey research conducted at a national level prompted the development of the NCHRBS.

Kolbe, Kann, and Collins (1993) found the most consequential health risk behaviors can be placed in one of six areas: behaviors that contribute to unintentional and intentional injuries, tobacco use, alcohol and other drug use, sexual behaviors that contribute to unintended pregnancy and STDs, unhealthy dietary behaviors, and physical inactivity. Unlike its predecessors, Douglas et al. (1997) reported that the NCHRBS was designed to measure health risk behaviors in all six health risk behavioral areas and measure

> progress toward 11 national health objectives that target adolescents and young adults; 17 national health objectives that target age groups that include college-aged people; and two national health objectives related to the availability and characteristics of health promotion programs on college campuses, including HIV education. (p. 56)

The development of the NCHRBS questionnaire was a collaborative effort between the CDC, and representatives from colleges and universities, national organizations, and federal agencies (DASH, 1997; Douglas et al., 1997). The final instrument consisted of 96 forced-choice answers designed for self-administration. Sampled students were mailed a survey packet which included a cover letter, questionnaire, pencil, and a postage-paid return envelope. The NCHRBS was conducted from January 1995 to June 1995 (DASH, 1997).

Reliability of many of the items included in the 1995 NCHRBS were reported by Brener, Collins, Kann, Warren, and Williams (1995), in their discussion on the reliability of the Youth Risk Behavior Survey (YRBS). Reliability was reported using Kappa statistics. From the YRBS, 53 behavior items were analyzed and for 72% of these items kappas were reported as "substantial, 61-80 percent or higher, and at least 90% of the items were reported as "moderate" or higher (Brener et al., 1995). Of the 53 behavioral items analyzed from the YRBS, 48 were included on the NCHRBS. Brener et al. (1995) discuss the difficulties in determining validity of self-report health behavior measures, but found that measures of drug, alcohol, and tobacco use are nearly accurate.

Web-based Survey Computer Software

Perseus SurveySolutions for the Web is a computer software created for researchers who design surveys for Web administration. SurveySolutions allows the researcher to design or modify a questionnaire in a word processing interface. The software converts the questionnaire into a form for publishing on the Web (Truppin, Benson, Nelson, Washburn, & Henning, 1997).

A survey form has an assigned form handler, which is the CGI script on the server that receives data from the forms field and processes and returns as a completed survey response. The Web Publishing Wizard feature automatically generates appropriate HTML tags and CGI script for handling survey responses. The researcher can manually add HTML tags to the document to customize the questionnaire. Additionally, SurveySolutions collects and stores survey responses and calculates summary statistics and frequencies. Data also may be exported in an ASCII format to be used by the Statistical Analysis System (SAS) (Truppin et al., 1997).

Summary

This chapter provided a discussion that supports the purpose and need for this study. Health surveys have been successfully conducted using the three traditional methods of data collection and at times researchers have found it necessary to incorporate more than one method in a single study. Recently researchers successfully explored alternative data collection methods branching into various forms of computer-assisted surveys. Over the past two decades computer-assisted survey research has been explored to complement traditional survey research methodology. Computer surveys have increased objectivity, reliability, and cost effectiveness, easing their adoption into survey research as data collection tools (Booth-Kewley, Edwards, & Rosenfeld, 1992; de Leeuw & Nicholls, 1996; Finegan & Allen, 1994; Lautenschlager & Flaherty, 1990). Both the Internet and Web also have been involved with advancing health survey research. However, few studies have been conducted to determine the feasibility of using Web-based surveys as a tool for collecting data, yet design elements and technology for this method demonstrate potential for survey researchers.

Chapter 3 describes the methods used to conduct the research project. Specifically, Chapter 3 includes a description of the research design; the research variables; the population; the instrumentation; the data collection procedures; and data analysis.

CHAPTER 3
MATERIALS AND METHODS

This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey. This chapter describes methods used to conduct the research project. Specifically, it includes descriptions of the research design, research variables, population, instrumentation, data collection procedures, and data analysis.

Research Design

The study was a true experimental design with random assignment. Of all the quantitative research designs, experiments are the most powerful and provide the most rigorous tests (Aday, 1996; Gall, Borg, & Gall, 1996; Isaac & Michael, 1995). Aday (1996) defines true experiments as studies where the researcher can "assume that individuals in the experimental and control groups are equivalent, so that the only reason they might differ on the outcomes of interest is the program or intervention itself" (p. 30-31). Randomization involves the appropriate use of sampling procedures that ensures groups are equivalent prior to the experimental procedure (Gall, Borg, & Gall, 1996; Isaac & Michael, 1995; Sarvela & McDermott, 1993). Isaac and Michael (1995) describe randomization as the most powerful technique in controlling for extraneous variance. Randomization "controls for all possible extraneous variables simultaneously...this means randomly selected subjects who are randomly assigned to groups which, in turn, are randomly assigned the treatment or control conditions" (Isaac & Michael, 1995, p. 86).

Gall, Borg, and Gall (1996) stated that the most difficult responsibility of experiments involves eliminating all extraneous variables. Extraneous variables are variables other than the independent variable that, if not controlled can affect the experimental outcome (Gall, Borg, & Gall, 1996). Extraneous variables threaten an experiment's internal validity. Internal validity is "the extent to which we can presume causality, i.e., that the effects identified were really attributable to the program, and not to extraneous factors or other explanations" (Sarvela & McDermott, 1993, p. 111). Therefore "the goal in designing an experiment is to create a set of conditions such that any observed changes can be attributed with a high degree of confidence to the experimental treatment rather than to extraneous variables" (Gall, Borg, & Gall, 1996, p. 473).

External validity also represents an important issue in true experimental designs. External validity is "the extent to which the findings of an experiment can be applied to individuals and settings beyond those that were studied" (Gall, Borg, & Gall, 1996, p. 473). External validity of a research design can be strengthened if the researcher describes the population to which the results will apply before the experiment is administered (Isaac & Michael, 1995).

For this study, two methods of collecting survey data about college student health behaviors were compared. Two forms of the 1995 National College Health Risk Behavior Survey were developed. One form was constructed as a self-administered paper and pencil questionnaire delivered to participants through standard United States postal mail. The second form was prepared for distribution by the World Wide Web (Web). Both forms contained identical items, and the content sections were organized and presented in the same order. Randomly selected participants were randomly assigned to either the mailed, self-administered survey group or to the Web-based survey group.

Research Variables

In an experimental study, the researcher controls or manipulates one or more factors called independent variables. The researcher then observes the effects of the manipulation on dependent variables. Dependent variables are variables measured in response to independent variables (Aday, 1996; Gall, Borg, & Gall, 1996; Isaac & Michael, 1995; Sarvela & McDermott, 1993; Shavelson, 1996). The dependent variables are "expected to increase, decrease, or vary in some systematic fashion as the levels of the independent variable change" (Shavelson, 1996, p. 15).

This study included one independent variable: survey method. The student examined two forms of the independent variable. The first form was a mailed, self-administered questionnaire participants received by United States Postal mail. The second form was a Web-based questionnaire participants completed and submitted on the Web.

The study's dependent variables included response rate and response time, item completion and item completion errors, and number of items completed for sensitive questions. Response rate is defined as the percentage of a sample who responded to the survey and provided usable questionnaires (Alreck & Settle, 1995). Response time is a comparison between the time the researcher mails the survey to participants (mailed, self-administered questionnaire, and Web-based survey via e-mail notification then Web) and the receipt of the completed questionnaire, measured in days. Item completion refers to the total number of items completed. Item completion error refers to the number of unacceptable responses given. Questionnaire items are considered sensitive if they raise concerns about "disapproval or other consequences (such as legal sanctions) for reporting truthfully or if the question itself is seen as an invasion of privacy" (Tourangeau & Smith, 1996). Items also may be considered sensitive if they are personal or embarrassing in nature (Alreck & Settle, 1995; Lautenschlager & Flaherty, 1990). Number of items completed for sensitive questions refers to the total number of sensitive items completed.

An expert review panel comprised of health professionals and members of the population reviewed the questionnaire to identify sensitive items. Descriptive statistics in the form of frequency distributions, measures of central tendency, and measures of variability were used to identify the most sensitive items. The expert review panel is discussed further under the *Instrumentation* section.

Study Population

The defined population for the study included all University of Florida undergraduate students who were enrolled and had a GatorLink account during the 1999 Spring semester. The University of Florida is the state's oldest, largest, most comprehensive research institution. The University enrolls approximately 42,000 students. Undergraduate students comprise 77% of the enrollment, 17% are graduate students, and the remaining 6% are students enrolled in professional programs such as law, dentistry, or medicine.

All students who attend the University of Florida may obtain a GatorLink account free of charge and, with their GatorLink ID, may access a computer in the free computer laboratories around campus. In June 1998 the University of Florida instituted a student computer requirement. All students must have "access to and on-going use of" a computer. Software recommendations accompanying the requirement included an E-mail browser and World Wide Web browser, such as Netscape® or Microsoft Internet Explorer, both of which are available at no charge to University of Florida students.

The University of Florida provides five campus computer labs. These labs are located in the following campus buildings: Computer Science and Engineering Building, Architecture, Weil Hall, Bryan Hall, and Norman Hall. Student Government also supports one computer lab in the J. Wayne Reitz Union Building. Student residence halls also have per-room direct wiring.

Sarvela and McDermott (1993) noted that it is not always practical to study an entire population of interest. Sampling allows researchers to examine a portion of a population. "Sampling allows [researchers] to make valid generalizations after careful measurement of the variables of interest in a relatively small segment of the population" (Sarvela & McDermott, 1993, p. 221). For the purpose of this study, it was not feasible to examine all University of Florida students who had a GatorLink account. Therefore, the study used a random sample of University of Florida undergraduates students who had GatorLink accounts.

An original sample of 1,000 University of Florida undergraduate students who had GatorLink accounts was drawn. The 1,000 students were screened to ensure they were over age 18 and had a current mailing address. From the remaining sample, 600 names were randomly selected and 300 each were assigned either to the mail, self-administered survey group (UFHBS-M), or the Web-based survey group (UFHBS-W).

Instrumentation

The 1995 National College Health Risk Behavior Survey (NCHRBS) was developed to "monitor a broad range of priority health-risk behaviors among college students" (Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion [DASH], 1997, p. 2). The NCHRBS is part of the Youth Risk Behavior Surveillance System (YRBSS) which monitors six categories of priority health-risk behaviors among youth and young adults (DASH, 1997). In addition to the 1995 NCHRBS, the YRBSS as part of its mission conducted a household-based survey of a national sample of youth ages 12-21 years in 1992, and it conducts a biennial school-based survey of high school students at the national, state, and local levels (DASH, 1997; Kolbe, Kann, & Collins, 1993).

The NCHRBS questionnaire includes items concerning a range of health behaviors, both sensitive and non-sensitive. The NCHRBS has eleven major sections covering nine categories of priority health risk behaviors. The first section includes standard demographic questions, and the last section asks about student health information resources. The remaining nine sections are divided into the following behavioral areas: (1) personal safety and violence; (2) suicide ideation and attempts; (3) tobacco use; (4) alcohol use; (5) marijuana, cocaine, and other drug use; (6) sexual behaviors; (7) body weight; (8) dietary behaviors; and (9) physical activity.

Data collection instruments should be developed "relatively free from measurement error" (Sarvela & McDermott, 1999, p. 132). Reliability is an important concept when considering instrumentation and errors of measurement. Nunnally (1978) described reliability as "the extent to which measurements are repeatable" (p. 191). Nunnally (1978) also stated that measurements should be stable "over a wide variety of conditions in which essentially the same results should be obtained" (p.191). Sarvela and McDermott (1999) added "a reliable instrument is one that is consistent, dependable, and stable" (p. 132).

Reliability for several questions included in the 1995 NCHRBS were reported by Brener, Collins, Kann, Warren, and Williams (1995) in their discussion on the reliability of the 1991 Youth Risk Behavior Survey. Reliability was reported using Kappa statistics. From the 1991 YRBS, 53 behavior items were analyzed, and for 72% of these items kappas were reported as "substantial, 61-80 percent or higher, and at least 90% of the items were reported as "moderate" or higher (Brener et al., 1995). Of the 53 behavioral items analyzed from the 1991 YRBS, approximately 48 were included on the NCHRBS. Brener et al. (1995) discussed difficulties in determining validity of self-report health behavior measures, but found that measures of drug, alcohol, and tobacco use are nearly accurate.

For this study, the 1995 National College Health Risk Behavior Survey (NCHRBS) served as a model for the two forms of the independent variable. The NCHRBS was modified slightly based on changes made to items on the 1999 YRBS that also are included on, or are relevant to, the NCHRBS. The 1999 YRBS included many changes to the questionnaire, and only a few of the changes were addressed for the purpose of this study.

The 1999 YRBS added two items in the personal safety and violence section about abusive relationships and forced sexual intercourse. The NCHRBS already includes items on forced sexual intercourse in the sexual behavior sections, but it did not include the 1999 YRBS item on abusive relationships: "During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?" Therefore, the item was added to the study questionnaire.

The YRBS also added an item to measure prevalence of cigar use in the United States: "During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?" This item also was added to the study's questionnaire. One other change made to the 1999 YRBS, and subsequently to this questionnaire, was the response options to the item addressing method of birth control used the last time the participant had sexual intercourse. The NCHRBS and earlier versions of the YRBS did not include Depo-Provera or injectable birth control. The 1999 YRBS now includes the option, and it was included on this study's questionnaire as well.

Following these minor modifications, and for the purposes of this study, the researcher developed two forms of the modified NCHRBS. The first form, University of Florida Health Survey-M (UFHBS-M), was a modified NCHRBS mailed by standard United States postal mail participants in this survey group. The second form, University of Florida Health Behavior Survey-W (UFHBS-W), was developed for Web-based administration. Both forms of the questionnaire contained identical items, and the content sections were presented in the same order (aside from the modifications previously discussed).

One question was added to each questionnaire for the purposes of the study. The UFHBS-M included one item asking participants if they would have been willing to complete the questionnaire in a Web-based format. The UFHBS-W included one item designed to identify the location where participants completed the questionnaire. Thus, both forms of the questionnaire contained 99 items.

A panel of seven national experts and three members of the population were asked to review the questionnaire and identify sensitive items (Appendix H). The seven national expert panel members consisted of a staff member from a health education department in a university student health care center who is certified as a health education specialist; an assistant professor of health education in a department of public health with extensive college teaching experience and knowledge of questionnaire content; an associate professor from a department of health, physical education, and recreation with research and teaching interests related to questionnaire content; an associate professor in a department of community and family health from a College of Public Health; an associate professor in a department of communication sciences and disorders who specializes in health communication; a professor in a department of health science, kinesiology, recreation, and dance from a College of Education and Health Professions, with a background in sexuality; a professor in a department of health science education, with research and teaching interests in sexuality. Three members of the population also served as panel members. All three members were undergraduate students over age of 18; two were Hispanic and one was White. Panel members were initially contacted through an E-mail and/or a personal telephone call during January and February 1999.

To facilitate the questionnaire review process, each panel member received a packet of materials. The packet included a cover letter, a University of Florida Health Behavior Survey, a questionnaire assessment form, and a self-addressed, stamped return envelope (Appendix I). The cover letter and assessment form both provided the traditional definition of sensitive items. Based on their understanding of the definition and their experience, panel members were instructed to examine each item and check one of the following options: “yes ” the item is sensitive; “no” it is not sensitive; or “don’t know” if they were unable to make a decision.

Responses provided by the expert panel were tallied on a blank assessment form. Those items most frequently recorded as sensitive by the expert panel were used to answer research question number five. Items were labeled "sensitive" by consensual agreement (six out of ten). Results from the expert panel review are presented in Chapter 4.

Human Subjects

Before initiation of the pilot study, an application was submitted to the University of Florida Institutional Review Board (UFIRB) which reviews all University of Florida research projects involving human participants. This study, project number 1998-889, was approved January 13, 1999 through Jan 12, 2000 (Appendix J).

Pilot Study

A pilot study is "a small-scale, preliminary investigation that is conducted to develop and test the measures or procedures that will be used in a research study" (Gall, Borg, & Gall, 1996, p. 766). A pilot study not only attempts to detect problems with the questionnaire and data collection procedures, but with the data analysis procedures (Sarvela & McDermott, 1993). The researcher can correct any problems detected in the pilot study.

The pilot study tested procedures used for the Web-based survey. Students enrolled in the Department of Health Science Education Course, "HSC 3301--Health Science Education in Elementary Schools," during Spring of 1999 were asked by their instructor to participate voluntarily in a research project. The instructor did not explain the nature of the research project to the students. The instructor agreed to give each student who participated in the study two points of extra credit toward their final course grade. Students submitted their name and E-mail address on an index card (provided by the researcher to the instructor) if they were interested in participating (N=193). Only students with E-mail addresses were able to participate in the pilot study. The researcher accepted any E-mail address, not only GatorLink E-mail addresses, for the pilot study.

Pilot participants received an E-mail notification concerning the Web-based survey. If they had a GatorLink E-mail account they could link directly to the Web-based survey cover letter. If they were not able to link directly to the Web-based survey, the E-mail notification provided instructions for "cutting-and-pasting" the URL directly into their Web browser. Participants linked from the cover letter to the survey, completed the survey, and linked to a confirmation page. The confirmation page asked participants to provide their name, E-mail address, telephone number, and any comments about the survey. A list of student participants was provided to the instructor at the end of the pilot study.

Students in the pilot study were contacted by E-mail notification on January 19, 1999. They were asked to complete the Web-based survey by January 29, 1999. A follow-up E-mail was sent on January 25, 1999. On January 29, 1999, 170 survey responses had been received. Of those, 157 were usable, yielding a response rate of 81.3% (N= 193; n=157).

Based on findings from the pilot study, the following modifications were made to the survey: response options for item six (How do you describe yourself?) were placed in alphabetical order; and item eight (With whom do you currently live?) was changed to a "select all that apply" response option. Changes were made on both forms of the questionnaire. All other changes involved correction of typographical errors.

No malfunctions occurred in submitting responses for the Web-based survey. The software created the database of survey responses and performed statistical analysis (frequencies, means, standard deviations) as expected.

During the pilot study three student participants also were recruited to complete the Web-based survey under researcher observation. This procedure was done to observe and identify any difficulties actual participants might encounter in the Web-based survey process and to determine a more accurate completion time. The three student participants in this phase of the pilot study also were interviewed after completing the Web-based survey. The students were asked questions regarding their general reaction to the Web-based survey process and environment (e.g., color usage, font type and size, comprehension of directions); their observation of survey length; their reaction to the survey content; and any suggestions for incentives.

The average time to complete the 99-item questionnaire was estimated to be 11 minutes. Participants in this phase of the pilot study found the Web-based survey environment easy to read and understand. No comments were made about the color scheme and the font type and size being a barrier for completion. Participants did not find the questionnaire content to be sensitive, but they felt their peers might find some of the content sensitive, specifically the suicide items and sexual behavior items.

Overall, the preliminary response was positive. Students found the Web-based survey to be fast and user-friendly. Table 1 provides comments made by pilot study participants.

Table 1
Comments from Pilot Study Participants

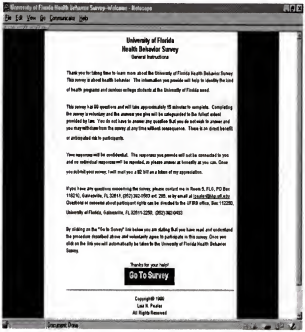
- The survey was thorough, interesting, and made you think.
- Very interesting.
- This survey was actually fun!
- I'm concerned about the confidentiality of my survey responses. For instance, I would not like my name shared with anyone, as some of the questions are extremely personal and others involve illegal drug use.
- I enjoyed participating in the survey.
- One of your beginning questions asks who you live with--this question does not let you choose more than one answer. Such as live with husband and children.
- I thought this was an interesting survey.
- I feel a little weird about submitting my identity after I just filled out such a personal questionnaire. I know it doesn't really matter, but it still bothers me a little to know the two could possibly be tied (?).
- This was an interesting survey. I wouldn't have had to have to be given extra credit just to take it.
- It didn't take that long.
- I thought the survey was very interesting.
- Warn people that personal questions will be asked.
- It was very well organized and detailed. The survey was also time efficient and easy to follow
- It was actually interesting to answer all these questions. It made me realize some things I need to be doing.
- Great and fast survey :).
- Interesting survey!
- Cool survey!!
- The questions were straight forward and easy to answer.

Data Collection

Following the random selection of University of Florida students who have a GatorLink account, the sample was randomly assigned to either the mailed, self-administered survey group (UFHBS-M) or the Web-based survey group (UFHBS-W). On March 17, 1999, the entire sample was mailed a pre-notification postcard by standard United States postal mail and an electronically mailed pre-notification message about the forthcoming survey. The pre-notification postcard and E-mail explained to the entire sample that, if they participated in the study, they would receive a $2 bill as compensation for participation. They were asked to watch their regular postal mail and their GatorLink E-mail for further information about the survey.

The self-administered questionnaire, in the form of a survey packet, was mailed to the UFHBS-M group on March 22, 1999, five days following the pre-notification postcard and E-mail. Six days (March 23, 1999) after the pre-notification postcard and E-mail were sent, the UFHBS-W group were sent an E-mail requesting participation in the Web-based survey. Most participant addresses for the UFHBS-M group were local Gainesville addresses, so most received the survey packet the day after they were mailed. Participants in both groups received information about the survey on the same day, March 23, 1999.

Participants assigned to the UFHBS-M group received a survey packet in the mail that contained a cover letter, the questionnaire, and a pre-addressed, postage-paid return envelope. The questionnaire included general instructions and the 99 items. Participants in this group marked their responses directly in the questionnaire booklet. When participants completed the questionnaire, they returned it to the researcher using the postage-paid return envelope provided. Upon receiving each returned questionnaire, the researcher mailed a $2 bill to the participant.



University of Florida Health Behavior Survey-Welcome - Netscape
File Edit View Go Communicator Help
Document: Done

University of Florida
Health Behavior Survey
General Instructions

Thank you for taking time to learn more about the University of Florida Health Behavior Survey This survey is about health behavior. The information you provide will help to identify the kind of health programs and services college students at the University of Florida need.

This survey has 60 questions and will take approximately 15 minutes to complete. Completing the survey is voluntary and the answers you give will be safeguarded to the fullest extent provided by law. You do not have to answer any question that you do not wish to answer and you may withdraw from the survey at any time without consequence. There is no direct benefit or anticipated risk to participants.

Your responses will be confidential. The responses you provide will not be connected to you and no individual responses will be reported, so please answer as honestly as you can. Once you submit your survey, I will mail you a $2 bill as a token of my appreciation.

If you have any questions concerning the survey, please contact me in Room 5, FLG, PO Box 118210, Gainesville, FL 32611, (352) 392-0583 ext. 285, or by email at lpealer@hhp.ufl.edu Questions or concerns about participant rights can be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, FL 32611-2250, (352) 392-0433

By clicking on the "Go to Survey" link below you are stating that you have read and understand the procedure described above and voluntarily agree to participate in this survey. Once you click on the link you will automatically be taken to the University of Florida Health Behavior Survey.

Thanks for your help!

Go To Survey

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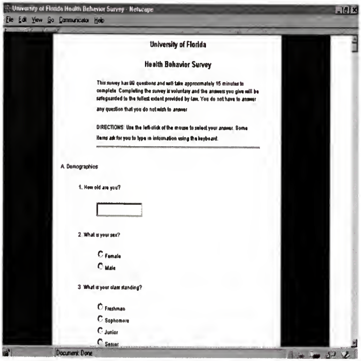
Figure 2. A screen capture of the Web-based survey group cover letter.

Participants assigned to the UFHBS-W group received an E-mail asking them to participate in the Web-based survey. If participants chose to participate, they were able to link directly from the E-mail message to the Web-based survey. The URL linked participants to the Web-based survey cover letter (Figure 2) . The cover letter described the purpose of the survey, and if participants agreed to participate, they selected a link which connected them to the questionnaire (Figure 3). Participants selected their answers on their computer monitor using the left-click of the mouse. The Web-based questionnaire included 99 items. At the end of the survey participants were instructed to select the "submit now" button to send the answers by E-mail to the researcher.


University of Florida Health Behavior Survey - Netscape
File Edit View Go Communicator Help
Document: Done

University of Florida

Health Behavior Survey

This survey has 99 questions and will take approximately 15 minutes to complete. Completing the survey is voluntary and the answers you give will be safeguarded to the fullest extent provided by law. You do not have to answer any question that you do not wish to answer.

DIRECTIONS: Use the left-click of the mouse to select your answer. Some items ask for you to type in information using the keyboard.

A. Demographics

1. How old are you?

2. What is your sex?

○ Female
○ Male

3. What is your class standing?

○ Freshman
○ Sophomore
○ Junior
○ Senior

Figure 3. A screen capture of the Web-based survey group questionnaire.

Once they selected the "submit now" button, participants immediately received an electronic thank-you on their screen. The electronic thank-you again explained to participants about the $2 bill they would receive as compensation for their participation. This thank-you consisted of an electronic form participants completed providing personal information (name, address, phone number, and E-mail address) to receive the $2 bill.

This Web document also had a "submit now" button which, when selected, would E-mail the researcher the information. This information was submitted as a separate file to the researcher and was not linked to the questionnaire information previously submitted by participants.

Approximately one week following the initial mail-out of both surveys, March 31, 1999, participants were mailed a reminder postcard and E-mail message. After four weeks, a computation of the initial response rate was calculated for both groups. Consequently, the researcher decided to mail a personalized, second follow-up letter by standard U.S. mail to participants in both groups who had not yet responded (Appendix K). A personalized, second follow-up E-mail letter also was sent to participants who had not yet responded.

Participants in both groups received a personal thank-you card and a $2 bill as compensation for participation (Appendix L). The original study plan proposed to offer participants an opportunity to win a monetary prize of $150. However, the University of Florida General Counsel reviewed state law and determined this to be an unacceptable University of Florida research practice. Therefore, the University of Florida Institutional Review Board was unable to approve the original proposal. Opportunities to win cash or prizes are considered games of chance or gambling. Constitutionally the State of Florida is the only institution in Florida permitted to operate games involving chance.

Preliminary Web-based survey research suggested both the $2 incentive for participants and the opportunity to win prizes as compensation for participation in Web-based surveys (Borer, Hebert, and Breshears, 1996; Gaddis, 1998; Kiernan, 1998;

Soetikno, Mrad, Pao, & Lenert, 1997). The initial proposal for a $150 prize appeared to be a more appealing prize to a college population. Based on the joint decision of the Florida General Counsel and University of Florida IRB, a $2 bill was approved as the incentive.

Data Analysis

Data collected from UFHBS-M were transferred from the paper questionnaire to electronic answer sheets (scantron sheets). The data were then scanned and saved in ASCII format to be read and analyzed using the Statistical Analysis System (SAS). Weiler (1997), in a survey of adolescent health concerns, also used this procedure to transfer data from questionnaires to scantron sheets for scoring. In Weiler's analysis of 10% of the cases, a ratio of errors to coding entries was 1:1,428, suggesting a high degree of confidence in the data coded and high degree of confidence in this additional design procedure. Data collected using the UFHBS-W were automatically formatted, E-mailed to the researcher, and transferred to the UFHBS-W database developed by the Web-based survey software, *Perseus*.

The study answered five research questions:

1. Does a difference exist between response rates for the mailed, self-administered survey and the Web-based survey?
2. Does a difference exist between response time for the mailed, self-administered survey and the Web-based survey?

3. Does a difference exist in the number of items completed for the mailed, self-administered survey and the Web-based survey?
4. Does a difference exist in item completion errors between the mailed, self-administered survey and the Web-based survey?
5. Does a difference exist in the number of sensitive items answered between the mailed, self-administered survey and the Web-based survey?

Descriptive statistics were generated for both groups to develop a demographic profile of the sample. Descriptive statistics in the form of frequency distributions, measures of central tendency, and measures of variability also were used to describe the entire data set.

To answer the five research questions, the response rates, response times, item completion, item completion errors and the number of sensitive items completed were calculated. Inferential statistics were used to examine the effects between the independent variable and dependent variables identified in research questions one through five.

The chi-square statistic (χ^2) was used to answer research question one. Chi square is "a means of answering questions about data existing in the form of frequencies, rather than as scores or measurements...the frequencies refer to the categories" in which the data has been classified (Isaac & Michael, 1995, p. 184). The chi-square statistic provides a measure of how much the two frequencies differ from one another.

Five assumptions underlie use of the chi-square statistic:

1. Each observation must fall in one and only one category,
2. The observations in the sample are independent of one another,
3. The observations are measured as frequencies,
4. The expected frequency for each category is not less than 5 for degrees of freedom greater than or equal to two, and not less than 10 for degrees of freedom equal to one,
5. The observed values of χ^2 with 1 degree of freedom must be corrected for continuity in order to use the table of values of χ^2_{critical}. (Shavelson, 1996).

Participants in the study were classified either as respondents or nonrespondents, then placed in only one of the two categories. Participants in the study were independent of each other. Respondents and nonrespondents were measured as frequencies. The expected frequency for each category, with only one degree of freedom, was not less than ten.

The *t-test* for independent means was used to answer questions two through five. Shavelson (1996) stated the purpose of the *t-test* for independent means is "to help the researcher decide whether the observed difference between two sample means arose by chance or represents a true difference between populations" (p. 344).

The *t-test* includes three specific design requirements:

1. one independent variable with two levels,
2. a subject that appears in one and only one of the two groups,
3. levels of the independent variable that may differ from one and another either qualitatively or quantitatively. (Shavelson, 1996, p. 346)

This study included one independent variable, survey method, with two levels, UFHBS-M and UFHBS-W. Members of the randomly selected population were randomly assigned to either the UFHBS-M group or the UFHBS-W group. Levels of the independent variable, survey method, differ qualitatively. One group received a paper-and-pencil self-administered questionnaire and the other group was assigned to the Web-based survey group.

Three assumptions apply when using the sampling distribution of *t* to test for differences between independent means:

> 1. scores in the two groups are randomly sampled from their respective populations, and they are independent of one another,
> 2. scores in the respective populations are normally distributed, and
> 3. Variances of the scores in the two populations are equal (i.e. $\sigma^2_1=\sigma^2_2$). This assumption is often called the assumption of homogeneity of variance. (Shavelson, 1996, p. 346-347)

Summary

Chapter 3 described the methods and materials used to conduct this study, and it provided a description of the research questions, the research design, the research variables, the study population, instrumentation, pilot study, data collection, and data analysis. In Chapter 4, results associated with the five research questions are reported including an overview of the demographics and profile characteristics of the two experimental groups in the study.

CHAPTER 4
RESULTS

This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey.

This chapter presents the data collected by the methods described in Chapter 3 using the mailed, self-administered University of Florida Health Behavior Survey and the Web-based form of the University of Florida Health Behavior Survey. Specifically, the demographics and profile characteristics of each group are presented and the findings of data analysis related to the research questions are reported.

Study Demographics and Profile Characteristics

This section describes the demographic and profile characteristics of the two experimental groups in this study: the mailed, self-administered survey group (UFHBS-M) and the Web-based survey group (UFHBS-W). The defined population for this study was all University of Florida undergraduate students who were enrolled and had a GatorLink account in the Spring of 1999 ($\underline{N}$=22,652). Names, current mailing addresses and current GatorLink E-mail addresses were randomly selected during the fifth week of the semester (n=600). The selected names were then randomly assigned to either the UFHBS-M group (n=300) or the UFHBS-W group (n=300).

Of the 600 students selected to participate in the study, 365 completed and returned a questionnaire, yielding 361 usable questionnaires for a response rate of 60.2%. Rejection of questionnaires was based on judging the completeness of all sections, on identifying hostile or superfluous response patterns, and identifying duplicate submissions (Web-only). Only four questionnaires were rejected, all were from the Web-based survey group. Two questionnaires were blank and 2 were duplicate submissions. Table 2 contains a summary of response rates by group.

Table 2

Response Rate By Group

Group	**Mailed**	**Returned**	**Usable**	**%**
Mail	300	186	186	62.0
Web	300	179	175	58.3
Total	**600**	**365**	**361**	**60.2**

Of the total usable responses, 55.7% were from females (n= 201) and 44.6% males (n=159), with a mean age of 20.39. Close to three-fourths of the participants were white (n= 260, 72.0%), most (n= 353, 97.8%) were full-time students, and the majority (n=285, 78.9%) lived with roommates or friends, residing in an off-campus house or apartment (n=121, 61.2%). Only 16% (n=59) of the sample were members of a social fraternity or sorority. A majority of participants (n=201; 55.7%) did not work during the Spring semester. Just over half (n=197; 54.6%) of the participants had mothers who graduated from college, while 64.3% (n=232) had fathers who graduated from college. Three-fourths (n=271; 75%) of the participants reported some kind of health care coverage. Table 3 provides a comparison of the demographics and profile characteristics of each group, the study sample, and the University of Florida population. Chi-square analysis of the demographic variables (gender, year in school, and race) showed no significant difference between the mail, self-administered group, and the Web-based survey group, confirming the two group's homogeneity.

Table 3

A Comparison of Study Sample and University Population (Expressed in Percentages)

Demographic	UFHBS-M (n=186)	UFHBS-W (n=175)	Sample (n=361)	University† (n=31,329)
Gender				
• Male	43.5	45.1	44.0	50.0
• Female	56.5	54.9	55.7	50.0
Year in School				
• Freshman	20.0	19.4	19.7	15.4
• Sophomore	22.2	28.6	25.2	21.2
• Junior	26.6	27.3	26.9	29.0
• Senior	28.6	25.7	27.1	34.4
Race				
• Asian	6.5	11.4	8.9	6.0
• Black	5.4	8.0	6.6	6.0
• Hispanic	10.8	7.4	9.1	9.0
• White	73.1	70.9	72.0	69.0
• Other	4.3	1.7	3.0	-----

† University estimates are approximations based on 1998 undergraduate enrollment

Research Question One

Does a difference exist between response rates for the mailed, self-administered survey and the Web-based survey? Chi-square analysis was used to examine if a statistically significant difference existed in the number of respondents between the two groups (UFHBS-M and UFHBS-W). Participants in each group were classified as either respondents or nonrespondents, and placed in one of the two categories. The expected frequency for each category, with one degree of freedom, was not less than ten. The observed value of χ^2 because there is one degree of freedom was corrected for continuity before using the table of values of $\chi^2_{critical}$. Table 4 provides the contingency table used to calculate the Chi-square statistic.

Table 4

Chi-square Analysis of the Contingency Table for Response Rate by Group

Group	**Nonrespondents**	**Respondents**	**Row Total**
UFHBS-M	114	186	300
UFHBS-W	125	175	300
Column Total	239	361	600

- Chi-square = .8415
- Yate's correction for continuity = .6954
- df = 1;
- p = .3590

Table 4 indicates no significant difference exists between response rates for the mail, self-administered survey group and the Web-based survey group (χ^2=.6954, df=1, p=.3590).

Research Question Two

Does a difference exist between response time for the mailed, self-administered survey and the Web-based survey? The *t-test* for independent means was used to examine if a statistically significant difference existed between the two groups on the mean number of days needed to complete and return the survey questionnaire. The *t-test* for independent means was used to examine if the observed difference between the two sample means occurred by chance or represented a true difference between populations.

For both the UFHBS-M and UFHBS-W group, days were measured from March 23, 1999 (day 1) until the day received by the researcher. In the UFHBS-M group (n=184) the number of days fell between 2 to 25 days with a mean of 9.75 (SD=7.12). In the UFHBS-W group (n=172) the number of days fell between 1 to 24 with a mean of 7.34 (SD=7.52). Questionnaires received after April 16, 1999 were excluded from this calculation. Table 5 provides the *t-test* results and associated descriptive statistics.

Table 5 indicates a significant difference exists between the two groups in the mean number of days required to complete and return the survey questionnaire. On average, the Web-based survey method required 2.42 less days to complete and return a survey questionnaire.

Table 5

Descriptive Statistics and *t-test* Results Comparing the Web-based Survey Group and the Mailed, Self-Administered Survey Group on Mean Number of Days Needed to Complete and Return Questionnaire

Item	**UFHBS-W**	**UFHBS-M**
N	172	184
Mean # of Days	7.34	9.76
Standard Deviation	7.52	7.12
Minimum	1	2
Maximum	24	25
T-value	3.1156	
P-value	.0020	

† Questionnaires received after April 16, 1999, were excluded from this calculation.

Research Question Three

Does a difference exist in the number of items completed for the mailed, self-administered survey and the Web-based survey? To answer this research question a *t-test* for independent means was used to examine if a statistically significant difference existed between the two groups on the mean number of items not answered per questionnaire, per group. The *t-test* for independent means was used to examine if the observed difference between two sample means occurred by chance or represented a true difference between populations. Table 6 provides the *t-test* results and associated descriptive statistics for analyzing the average number of items not answered per questionnaire, per group.

Table 6

Descriptive Statistics and *t-test* Results Comparing the Web-based Survey Group and the Mailed, Self-Administered Survey Group on Mean Number of Items Not Answered Per Questionnaire

Item	**UFHBS-W**	**UFHBS-M**
N	175	186
Mean	14.05	14.07
Standard Deviation	6.43	7.45
Minimum	3	3
Maximum	31	30
T-value	0.0251	
P-value	0.9800	

Results from the *t-test* indicate there is no significant difference between the two experimental groups on the number of questionnaire items not answered. Therefore, method of survey, Web or mailed, did not influence the number of items participants completed on the University of Florida Health Behavior Survey.

Research Question Four

Does a difference exist in item completion errors between the mailed, self-administered survey and the Web-based survey? The *t-test* for independent means was used to examine if a statistically significant difference existed between the two survey groups on the mean number of item completion errors per group. The *t-test* for independent means was used to examine if the observed difference between two sample means occurred by chance or represented a true difference between populations.

Item completion errors were defined as inappropriate text responses, incorrectly following directions for contingency questions, and selecting multiple responses when only one was requested. Items left blank were not considered errors. The number of errors in the UFHBS-W group were between 0 to 9 with a mean of 0.37 (SD=1.31). In the UFHBS-M group the number of errors also were between 0 to 9 with a mean of 0.50 (SD=1.46). Table 7 provides the *t-test* results for difference in item completion errors per group. The *t-test* for independent means found no significant difference between the two survey groups on the mean number of item completion errors. Survey method did not affect the number of item completion errors made on either form of the University of Florida Health Behavior Survey.

Table 7

Descriptive Statistics and *t-test* Results Comparing the Web-based Survey Group and the Mailed, Self-Administered Survey Group on Mean Number of Item Completion Errors

Item	**UFHBS-W**	**UFHBS-M**
N	175	186
Mean # of Errors	0.37	0.50
Standard Deviation	1.31	1.46
Minimum	0	0
Maximum	9	9
T-value	0.8798	
P-value	0.3796	

Research Question Five

Does a difference exist in the number of sensitive items answered between the mailed, self-administered survey and the Web-based survey? To answer this research question a *t-test* for independent means was used to examine if a statistically significant difference existed between the two survey groups on the number of sensitive items not answered. The *t-test* for independent means was used to examine if the observed difference between two sample means occurred by chance or represented a true difference between populations. Sensitive items were identified through an expert panel review. The expert panel review process is described in Chapter 3.

Responses provided by the expert panel were tallied on a blank assessment form. Those items most frequently recorded as sensitive by the expert panel were labeled "sensitive" by consensual agreement (six out of ten). Table 8 provides a summary of the 17 items labeled sensitive by the expert panel review.

Not all items found to be sensitive by the expert panel were used. Certain items were part of a contingency series of questions, thus precluded usage. For example, the expert panel selected the item, "During the past 30 days, how many times did you use marijuana?" Participants, however, were only asked to answer this question if on a previous item, "During your life, how many times have you used marijuana?" they had responded with a number greater than 0. If participants had selected "0 times" they were instructed to skip to another topic, hence skipping the remaining items pertaining to marijuana including the item selected by the expert panel as being sensitive. To address the issue that participants might be reluctant to answer survey items pertaining to illegal drug use (in this example), the researcher selected the initial question if the items were part of a contingency format. The expert panel selected four items that were part of a contingency format. Table 9 provides a listing of the 13 items used to determine the mean number of sensitive items completed per questionnaire.

Table 10 provides *t-test* results and associated descriptive statistics for analyzing number of sensitive items not answered per group. The results indicate there is a significant difference between the Web-based survey group and the mailed survey group on the number of sensitive items completed. Participants in the Web-based survey group on average completed more sensitive questions than participants in the mailed survey group.

Table 8

Sensitive Health Behavior Survey Items as Determined by an Expert Panel

Personal Safety and Violence

- During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?

Suicide Ideations and Attempts

- During the past 12 months, did you ever seriously consider attempting suicide?
- During the past 12 months, did you make a plan about how you would attempt suicide?
- During the past 12 months, how many times did you actually attempt suicide?
- If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose, that had to be treated by a doctor or nurse?

Marijuana, Cocaine, and Other Drugs

- During the past 30 days, how many times did you use marijuana?
- During your life, how many times have you used any form of cocaine including powder, crack, or freebase?
- During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?
- During your life, how many times did you used the crack or freebase forms of cocaine?
- During your life, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- During the past 30 days, how many times have you used any illegal drug in combination with drinking alcohol?
- During your life how many times have you used a needle to inject any illegal drug into your body?

Sexual Behavior

- How many times have you been pregnant or gotten someone pregnant?
- During your life, have you ever been forced to have sexual intercourse against your will?
- How old were you the first time you were forced to have sexual intercourse against your will?
- How old were you the last time you were forced to have sexual intercourse against your will?

Table 9

Health Behavior Survey Items Used to Determine the Number of Sensitive Items Completed Per Questionnaire

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Personal Safety and Violence

- During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?

Suicide Ideations and Attempts

- During the past 12 months, did you ever seriously consider attempting suicide?
- During the past 12 months, did you make a plan about how you would attempt suicide?
- During the past 12 months, how many times did you actually attempt suicide?
- If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose, that had to be treated by a doctor or nurse?

Marijuana, Cocaine, and Other Drugs

- During your life, how many times have you used marijuana?
- During your life, how many times have you used any form of cocaine including powder, crack, or freebase?
- During your life, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- During the past 30 days, how many times have you used any illegal drug in combination with drinking alcohol?
- During your life how many times have you used a needle to inject any illegal drug into your body?

Sexual Behavior

- How many times have you been pregnant or gotten someone pregnant?
- During your life, have you ever been forced to have sexual intercourse against your will?

Table 10
Descriptive Statistics and *t-test* Results Comparing the Web-based Survey Group and the Mailed, Self-Administered Survey Group on Number of Sensitive Items Not Answered

Item	**UFHBS-W**	**UFHBS-M**
N	175	186
Mean	0.31	0.51
Standard Deviation	0.62	0.71
Minimum	0	0
Maximum	3	5
T-value	2.83	
P-value	0.0049	

Summary

This chapter reported the results associated with the five research questions. First, an overview of the demographics and profile characteristics of the two experimental groups in this study was presented. Table 2 provides a description of the response rate by group, while Table 3 compared the study sample and the University population by gender, year in school, and race.

Second, findings from the data analysis related to the research questions were presented. Chi-square analysis was used to examine if a statistically significant difference existed in the number of respondents between the two experimental groups (Table 4). Results of the chi-square analysis showed there was no significant difference between the response rates for the mailed, self-administered survey group and the Web-based survey group.

The *t-test* for independent means was used to measure if a statistically significant difference existed between the two groups on the mean number of days needed to complete and return the survey questionnaire (Table 5); number of items completed (Table 6); number of item completion errors (Table 7); and number of sensitive items answered (Table 10). A significant difference was found between the two groups on the mean number of days needed to complete and return the survey questionnaire ($\underline{p}$=.002). No significant difference was found between the two groups on the number of items completed per questionnaire. Likewise, no significant difference was found between the two groups on the mean number of item completion errors.

Prior to the *t-test* results for the final research question, the researcher presented the results of the expert panel review. An expert panel identified sensitive questions on the University of Florida Health Behavior Survey. Table 8 presented the 17 questions labeled sensitive by the expert panel review process. After a review of each item labeled sensitive, the researcher discarded those questions exclusively associated with a contingency question format and replaced them with only the initial question in the contingency series. Table 9 presented the final 13 questions used to answer the last research question.

The *t-test* results indicated there is a significant difference between the Web-based survey group and the mailed survey group on the number of sensitive items completed. Participants in the Web-based survey group, on average, completed more sensitive items.

Chapter 5 presents a summary of the purpose, methodologies, results, conclusions, discussion, and recommendations from the study. A research design and data collection model for future research are presented as well.

CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Summary

This chapter presents a summary of the purpose, methodologies, results, conclusions, discussion, and recommendations from the study. Recommendations include implications for future Web-based survey research. A research design and data collection model for future research is proposed as well.

This study determined the feasibility of collecting health behavior data from a random sample of University of Florida undergraduate students using a Web-based survey. The study employed a true experimental design with random assignment and included two experimental groups: the mailed, self-administered survey group (UFHBS-M) and the Web-based survey group (UFHBS-W). The study included one independent variable: survey method. There were two forms of the independent variable. The first form was a mailed, self-administered questionnaire. The second form was a Web-based questionnaire participants completed and submitted on the Web. The study's dependent variables included response rate, response time, item completion, item completion errors, and number of sensitive items completed.

The defined population for the study included all University of Florida undergraduate students enrolled and possessing a GatorLink account in Spring 1999

(N=22,652). Names, current mailing addresses, and current GatorLink E-mail addresses were drawn randomly during week five of the Spring semester (n=600). The selected names were assigned randomly either to the mailed, self-administered survey group (n=300) or to the Web-based survey group (n=300).

For the study, the 1995 National College Health Risk Behavior Survey (NCHRBS) served as the model for the two forms of the independent variable (Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion [DASH], 1997) . The first form, University of Florida Health Survey-M (UFHBS-M), was modified from the NCHRBS then mailed to members of the mailed, self-administered survey group using the United States postal service. The second form, University of Florida Health Behavior Survey-W (UFHBS-W), was developed by the researcher for Web-based administration. Both forms of the questionnaire contained identical items and content sections were presented in the same order. One question was added to each questionnaire to support the purpose of the study. The UFHBS-M included one item asking participants if they would have been willing to complete the questionnaire in a Web-based format. The UFHBS-W included one item designed to identify the location where participants completed the questionnaire. Both forms of the questionnaire included 99 items.

A total of 365 questionnaires was returned, but only 361 were usable, yielding a response rate of 60.2%. Rejection of questionnaires was based on judging the completeness of all sections, on identifying hostile or superfluous response patterns, and identifying duplicate submissions (Web-only). Only four questionnaires were rejected, all were from the Web-based survey group.

The study answered five research questions:

1. Does a difference exist between response rates for the mailed, self-administered survey and the Web-based survey?
2. Does a difference exist between response time for the mailed, self-administered survey and the Web-based survey?
3. Does a difference exist in the number of items completed for the mailed, self-administered survey and the Web-based survey?
4. Does a difference exist in item completion errors between the mailed, self-administered survey and the Web-based survey?
5. Does a difference exist in the number of sensitive items answered between the mailed, self-administered survey and the Web-based survey?

Descriptive statistics were generated for both groups to develop a demographic profile of the sample. Descriptive statistics in the form of frequency distributions, measures of central tendency, and measures of variability also were used to describe the entire data set. Chi-square analysis was used to determine if a statistically significant difference existed in the number of respondents between the two groups (UFHBS-M and UFHBS-W). The *t-test* for independent means was used to answer research questions two through five.

Conclusions

Chi-square analysis showed no statistically significant difference between the response rates for the mailed, self-administered survey group and the Web-based survey group. However, there was a statistically significant difference between the two groups on the mean number of days needed to complete and return the questionnaire. On average, the Web-based survey group required 2.42 less days to complete and return than did the mailed survey. No significant difference was found between the two groups on either the number of items completed per questionnaire or on the mean number of item completion errors. Also, analysis found a statistically significant difference between the Web-based survey group and the mail survey group on the number of sensitive items completed. Participants in the Web-based survey group, on average, completed more sensitive items. These results demonstrated the feasibility of using a Web-based survey for collecting health behavior data from undergraduate students who attend the University of Florida. Based on these results, the following conclusions were drawn.

A response rate of 60.2% (n=361) reflected the population's willingness to participant in a health behavior survey. Several participants from both groups requested results from the survey or asked where they might obtain the results, suggesting an interest in the health content of the survey. Opinions and comments from participants in the Web-based survey group were overwhelmingly positive with regard to all aspects of the survey process. The demographics and profile characteristics of both study groups were similar to each other and to the larger University population, suggesting that the Web-based survey method did not discourage participation. University of Florida undergraduate students seemed interested in both the questionnaire content (health) and in the survey process (Web).

Response time, defined as the number of days required for participants to complete and return the questionnaire used in this study, may influence researcher choices of a survey method. Web-based survey research on average requires less time for participants to complete and return a questionnaire. Participants in the Web-based survey group responded to Web-based survey requests quicker than did participants to the mailed, self-administered survey group.

Regardless of form, the University of Florida Health Behavior Survey was a lengthy questionnaire (99 items). However, the average number of questionnaire items completed in the Web-based survey group was similar to mailed, self-administered survey group. Participants in the Web-based survey group were as likely as their mailed, self-administered counterparts to complete a similar number of items on the survey questionnaire. Thus length of questionnaire did not appear to affect overall participation.

When completing the questionnaires, participants in the Web-based survey group and the mailed, self-administered survey group made a comparable number of errors. No participant exceeded nine errors. Likewise, participants in both groups made similar types of errors typically associated with a contingency question format. Participants in the Web-based survey group experienced no more difficulty in completing the questionnaire than did participants the mailed, self-administered survey group.

An expert panel identified 13 items on the University of Florida Health Behavior Survey as "sensitive." Researchers traditionally consider questionnaire items as sensitive if they raise concerns about disapproval or other consequences (such as legal sanctions) for reporting truthfully, or if the respondent considers the item an invasion of privacy. Items also may be considered sensitive if they are very personal or embarrassing in nature. Participants in the Web-based survey group answered, on average, more sensitive items than did participants in the mailed, self-administered survey group. Web-based survey group participants were more inclined to disclose potentially embarrassing or sensitive information than participants in the mail survey group.

Based on these conclusions, researchers and practitioners conducting health survey research with a university population having unimpeded access to the Internet and World Wide Web, should consider Web-based survey research as an alternative to mailed, self-administered survey research. While findings from the study only may be generalized to similar student populations attending colleges and universities with equivalent computing infrastructure and Internet access, the results should prove useful in research regarding other populations with access to the Internet and World Wide Web.

Discussion

Both the Internet and Web have been used in survey research. Of the studies conducted, most compared mailed, self-administered questionnaires, personal interviews, and E-mail surveys for differences in response rates and response effects (Good, 1997; Kiesler & Sproull, 1986; Kittleson, 1995; Schuldt & Totten, 1994). Few studies have been conducted to determine the feasibility of using Web-based surveys as a tool for collecting data of any type (Wu, 1997) particularly health survey data

(Bell & Kahn, 1996; Stones & Perry, 1997; Soetikno, Mrad, Pao, & Lenert, 1997). However, design elements and technology for this method demonstrate the potential for survey researchers. While Web surveys exist, most collect Web-user demographics rather than examine effectiveness of the Web as a method for data collection.

This study confirmed Web-based survey research as a feasible method of collecting health behavior data from a university student population with access to the Internet and World Wide Web. To determine the feasibility of Web-based survey research, the study examined and compared elements of mailed, self-administered survey research to Web-based survey research. Elements included in this examination were response rate, response time, item completion, item completion errors, and the completion of sensitive items. Comparisons also were made against demographic differences and cost effectiveness. A research design and data collection model for future Web-based survey research was developed, as well.

Demographic differences exist between Web users and the general United States population. Web users tend to be younger, more educated, and male (RelevantKnowledge®, 1998; Turner & Turner, 1998). Hewson, Laurent, and Vogel (1996) also noted that Web survey participants have an interest in technology.

Descriptive statistics generated in this study for both groups found gender to be nearly evenly distributed between males (44%) and females (56%). The Web-based group reported similar findings (45% for males; 55% for females). Both sets of data closely reflected the University population (Table 3), and gender data analogous to previous Web-based survey research (Bell & Kahn, 1996; Soetikno, Provenzale, & Lenert, 1996).

Chi-square analysis of the demographic variables (gender, year in school, and race) showed no significant difference between the mailed, self-administered survey group, and the Web-based survey group, confirming the two group's homogeneity.

Most Web-based survey group participants (66.3%) completed the survey with private access to a computer (college dorm/residence hall, off-campus house or apartment, parent/guardians home). Only 27.5% of Web-based survey group participants used a computer provided in a University computer laboratory. When participants in the mailed, self-administered survey group were asked if they would have been willing to complete the survey on the World Wide Web, 71.2% responded "yes."

Overall, comments made by participants in the Web-based survey group about the survey experience were positive (Appendix M). Most comments pertained to the questionnaire content and not to suspicions or concerns about the Web-based survey process. For example:

- The only thing that I didn't like about the survey is that you included oral sex as sexual intercourse and asked about contraception. I think that there should be a distinction between oral sex and genital sex in the survey.
- I think that there should have been an entry about the female condom as a method of birth control, it was left out, and is just as important as the male condom.
- I liked it, but it was very personal
- Good survey, I felt completely comfortable with answering the questions.
- Easy to do

- It was a straight to the point survey, easy to answer. I enjoyed providing my input.
- I was more than happy to do your survey and felt comfortable answering all of your questions (especially for a quick $2).
- It was interesting and easy.
- It wasn't too personal and I appreciated the online form for convenience.

It appears college students are comfortable with Internet communication technology. Participants in the study seem willing, interested, and eager to incorporate this technology into their daily lives. This response supports findings from previous computer-based survey research (Johnston & Walton, 1995; Paperney et al., 1990) which found younger populations more comfortable with, or even preferring, computers over traditional paper and pencil questionnaires.

The professional literature contains little information regarding use of sampling techniques in Web-based survey research. Convenience samples of open enrollment and passive recruitment (survey announcements on electronic mailing lists, listed in search engines) represent the norm for Web survey research to date. For example, Bell and Kahn (1996) passively recruited 4,876 survey participants for a Web-based survey. Likewise, Stones & Perry (1997) recruited 300 respondents within five weeks. Soetikno, Provenzale, and Lenert (1997) reported 582 visitors to an open enrollment Web site with approximately 30% ($\underline{n}$=170) completing the posted questionnaire. The current study design incorporated randomization at all levels, including a randomly selected sample randomly placed into research groups. The Web-based survey group recorded 238 visitors to the Web-based survey cover letter and 214 visitors to the Web-based questionnaire. However, the response rate was 59% (n=176) for the Web-based survey group and an overall response rate of 60.2% (n=361) for both groups. This response rate is acceptable and similar to other survey research response rates among college populations. Response rates fluctuate greatly for mailed, self-administered surveys among college populations regardless of the topic. For example, response rates ranged from a low of 35% (N=2,730; n=949) for a study of the characteristics of first-time students; 37.5% (N=5,160; n=1,935) for a student satisfaction survey at York University (Bell, 1994); to a high of 72% (N=447; n=322) for a survey of rural southern college students alcohol consumption patterns and family drinking history (Molstad, McMillan, Kher, & Kiocoyne, 1998).

Just as telephone surveys are plagued with services and devices to screen telephone calls which can lower response rates (Aday, 1996), Web surveys may too face similar circumstance. Web-based survey research incorporating a design similar to the current study may encounter several obstacles: (1) participants not attending to E-mail regularly; (2) participant computer systems purging old E-mail messages; (3) participants, intentionally or unintentionally, deleting a survey participation request and URL; (4) participants initially reading a request then forgetting to return to later for response. In addition to E-mail, the current study design offered other types of reminders to participants in both groups. Participants received postcards, personal letters, and E-mail messages as reminders. Questionnaire submissions from the Web-based survey group clustered around reminders for participation.

Incentives and questionnaire length also have been found to influence response rates. The most effective monetary incentives are those incentives enclosed with the first mailing rather than approaches promising payment on receipt of the completed questionnaire (Denton, Tsai, & Chevrette, 1988). However, Web-based surveys do not allow mailing an up-front, tangible incentive as do mailed survey packets. Creative approaches such as on-line coupons may be used to provide an up-front incentive to encourage participation in Web-based surveys and to maintain research parity between study groups. In this study, the amount of the incentive ($2.00 US) may not have been sufficiently attractive to this population, or they may not have trusted the incentive would be mailed on completion of the survey, thereby influencing response rate.

Questionnaire length, while possibly influencing response rate, also may influence the number of items completed. Research suggests lengthy questionnaires are better suited for personal interviews where interviewers can prevent premature termination of an interview, deal with participant boredom, and counter decreased motivation (Aday, 1996). Such strategies cannot be used with self-administered questionnaires, mailed or Web-based; therefore, they should be kept brief to encourage participant response. However, O'Rourke and O'Rourke (1983) found in a review of survey research literature that response rates do not dramatically decrease in relation to questionnaire length. Their review found that questionnaire length is not as important as participant interest in the topic and the ease by which the questionnaire can be completed (O'Rourke & O'Rourke, 1983). Findings from this study supported that conclusion.

Of the total usable questionnaires returned in this study, 99.4% of participants read the entire questionnaire and answered the final question on their respective questionnaires. No statistically significant difference was found between the two groups on the number of items completed per questionnaire, suggesting participants were not discouraged by the overall number of questionnaire items. This commitment to the survey process by the participants could be due, at least in part, to genuine interest in the health topics addressed.

Other Web-based survey research also reported high item completion rates. Bell & Kahn (1996) reported an overall item completion rate of 99.28% for a 36-item multiple choice Web-based questionnaire. Soetikno, Mrad, Pao, and Lenert (1997) also reported a high item completion rate for an 80-item multiple choice questionnaire. In a review of traditional survey methodologies, response rate, and questionnaire length, Aday (1996) found the content of health surveys, particularly telephone interviews, influence survey "success." Participants tend to be more interested in discussing their health than in consumer product marketing or politics.

In addition to a high item completion, Web-based surveys facilitate data entry thereby decreasing the chance for error. The difference in this study between the average number of item completion errors between the study groups was not significant, concluding participants in the Web-based survey group experienced no more difficulty in questionnaire completion than is expected in a paper-and-pencil survey format. Ease of completing Web-based surveys has been reported in the literature (Houston & Fiore, 1998; Schmidt, 1997), and the approach is supported by similar findings in computer-based and other electronic forms of survey research (Booth-Kewley, Edwards, & Rosenfeld, 1992; Kiesler & Sproull, 1986).

The most common type of errors found in this study, regardless of group, involved errors associated with contingency format. The college population felt comfortable answering multiple choice-type items. Likewise, experience in test-taking conditioned them to answer each item. Both the UFHBS-M and UFHBS-W required the close attention of participants in correctly following the contingency question format.

While Web-based surveys are easy to complete they also have been found to provide a faster overall response time. In this study, most (51%) Web-based questionnaires were received within three days of the initial mail-out. The remaining questionnaires were received in clusters immediately after the follow-up E-mail and the second reminder E-mail. Little activity occurred between these times. Web-based survey participants seemed to either complete the survey immediately or not at all. Some participants may have intended to complete it at a later time, but did not remember until the follow-up E-mails. Some participants E-mailed the researcher to apologize for their forgetfulness.

Unlike regular mail, the E-mail medium does not allow for visual reminders. As such, mail surveys were returned at a more uniform rate. The visual cue provided by the over-sized green and white envelope and gray survey on the desk helped to maintain interest and remind participants to respond. Even so, a difference occurred in the average number of days required to complete and return the questionnaire. Participants in the Web-based survey group, on average, required 2.42 less days to complete and return their questionnaires than did participants in the mailed, self-administered survey group.

While no Web-based survey research has yet reported findings on time estimates and comparisons between survey type, these study results were similar to findings from other E-mail surveys. E-mail survey research has reported a faster response time from their participants (Kiesler & Sproull, 1986; Kittleson, 1995; Schuldt & Totten, 1994), when compared to mailed, self-administered surveys.

When choosing a survey method, time is a factor as it relates to the researcher for questionnaire preparation and data entry. The Web-based survey group required less researcher time for preparation, publication, and data entry than did the mailed, self-administered survey group. The time efficiency of Web-based surveys has previously been reported in the literature (Schmidt, 1997).

Houston and Fiore (1998) proposed in early literature on Web-based surveys, that participants may be more "disclosing and direct" (p. 117) on Web-based surveys compared to more traditional mailed, self-administered surveys because of an increased perception of anonymity. This study found participants more willing to answer sensitive items or those items identified as subject contamination from social desirability. Previous computer-based survey research (Booth-Kewley, Edwards, & Rosenfeld, 1992; Finegan & Allen, 1994; Kiesler & Sproull, 1986; Martin & Nago, 1989; Skinner & Allen, 1983; Tourangeau & Smith; 1996) found that the impersonal or non-social nature of the computer setting reduces the tendency toward social desirability and allows participants to admit to socially undesirable behaviors.

While participants in the Web-based survey group answered more sensitive items, researchers should exercise caution if a research design relies solely on use of campus computer laboratories. The close proximity of computers in the laboratories, and the presence of other students waiting for the computers, might discourage participants from answering candidly. Few participants in the Web-based survey group reported a concern in the Web-based survey comment section. However, Beebe et al. (1998) in a study of computer- administered surveys founds students were more likely to report various types of sensitive information in the paper and pencil questionnaire than in the computer form. Beebe et al., (1998) concluded their study design, which relied on school computer laboratories where computers and students were in close proximity, may have influenced the findings.

Future Web-based survey research should examine elements associated with the traditional survey research methods to determine if they affect response rates of Web-based surveys. Elements to consider include number and type of follow-ups, monetary incentive amounts, varying types of incentives, and questionnaire length. Additionally, researchers need to explore, identify, and clarify those features of Web-based survey research unique to the medium.

Web-based surveys deserve the attention and consideration of survey researchers. As illustrated in Figure 4, Web-based survey research can substantially reduce the cost of conducting large-scale survey research projects. In this study, cost per participant was estimated at $2.58 (n=300) for the Web-based survey group, and $6.05 (n=300) for the mailed, self-administered survey group. Based on response rate however, the actual unit cost was $4.42 for the Web-based survey group (n=175) and $9.76 for the mailed, self-administered survey group (n=186).

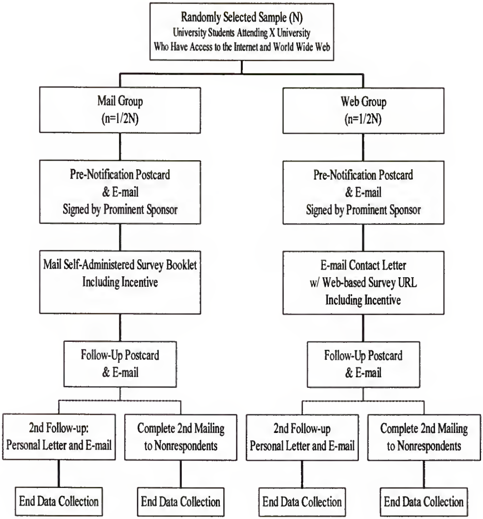
	Survey Group	
Item	**UFHBS-W (n=300)**	**UFHBS-M (n=300)**
Software	$179.00	N/A
Printing	$ 18.00	$450.00
Letterhead	$ 7.00	$ 14.00
Envelopes	$ 10.00	$ 92.00
Labels	$ 13.00	$ 103.00
Postage	$176.00	$764.00
Incentive ($2 US)	$350.00	$372.00
Thank-you Cards	$ 20.00	$ 20.00
TOTAL	$773.00	$1815.00
Estimated Unit Cost †	$ 2.58	$ 6.05
Actual Unit Cost *	$ 4.42	$ 9.76

† Estimated Unit Costs were based on n=300 for each group
* Actual Unit Costs were based on n=175 for UFHBS-W; and n=186 for UFHBS-M

Figure 4. A cost comparison of Web-based survey research and mailed, self-administered survey research.

A replication study would require additional investment in services and products such as printing and postage for both groups. However, for the Web-based survey group, the overall cost would decrease by the price of the Web-based survey software. This software, which can create numerous and varied Web-based surveys, is not limited to one questionnaire per software purchase. Therefore, depending on the purpose and design of the survey, it is practical to envision a nearly cost-free method of conducting Web-based survey research (after computer hardware and software purchases). The cost effectiveness of Web-based surveys (Bell & Kahn, 1996; Gaddis, 1998; Schmidt, 1997); E-mail surveys (Parker, 1992); and other forms of computer-based survey research (Beebe et al., 1997; Finnegan & Allen, 1994; Kiesler & Sproull, 1986; Lautenschlager & Flaherty, 1990) has been demonstrated and discussed in previous research.

Additional Web-based research will help increase the generalizability of present findings and advance the method for collecting health behavior data. Web surveys easily could be applied to a variety of questionnaires regularly used in health survey research. The demographics of Web users are increasing in diversity which "increases availability of samples whose diversity approximates that of the entire population, and it also makes distinct groups directly accessible for research specific to group definitions" (Hewson, Laurent, & Vogel, 1996, p. 186). Until Web users represent the population at-large, targeting specific populations can strengthen the external validity of the research design. Figure 5 illustrates a suggested experimental Web-based survey research design and data collection model. The model is adjusted based on lessons learned from the current study, and it incorporates traditional survey research techniques worth examining in a Web-based format.



NOTE: Dashed Line (-------) indicates researcher choice between two options.

Figure 5. A proposed model for conducting Web-based survey research using an experimental design.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

1. Conduct additional research using this study design at other Research I Universities where students have a computer requirement and free access to E-mail and the World Wide Web to determine if the results from this study can be replicated.
2. Conduct additional research using this study design at other colleges and Universities, such as Doctoral and Master's Granting Universities, Baccalaureate (Liberal Arts) Colleges, Associate of Arts Colleges, and Professional Schools and Specialized Institutions where students have a computer requirement and free access to E-mail and the World Wide Web to determine if the results from this study can be replicated.
3. Conduct additional research using this study design at traditionally and historically Black colleges and universities where students have a computer requirement and free access to E-mail and the World Wide Web to determine if the results from this study can be replicated.
4. Conduct additional research using this study design with other age groups, both younger and older, who have access to the E-mail and World Wide Web. Such populations might include public school and worksite settings.
5. Use a prominent sponsor to introduce the survey to possibly increase the response rate in future research. For example in this study, the signature of Dr. John V.

Lombardi, President of the University of Florida, on the cover letter may have increased participation.

6. Offer a more attractive incentive to increase the response rate in future research. The study's original plan proposed to offer participants an opportunity to win a monetary prize of $150. However, the University of Florida General Counsel reviewed state law and deemed this procedure unacceptable at the University of Florida. Therefore, the University of Florida Institutional Review Board could not approve the original proposal. Opportunities to win cash or prizes are considered games of chance or gambling. Only the *State of Florida* can run such operations.
7. Offer an up-front incentive to increase the response rate in future research. The incentive could be mailed with the survey packet. However, an up-front incentive presents methodological problems with Web-based survey research. Suggestions to overcome problems include sending an electronic coupon E-mailed to Web-based survey participants with the initial contact letter or posting Web coupons at the survey's Web site.
8. Select E-mail addresses based on account activity to ensure the highest possible response rate in future research. GatorLink E-mail accounts were provided free to all University of Florida students and these accounts are required to use University computer laboratories. However, students can and many do either forward their GatorLink E-mail to personal E-mail accounts not operated by the University (e.g. AOL) or they do not actively use their GatorLink E-mail accounts. After participants received either the prenotification postcard or the second follow up

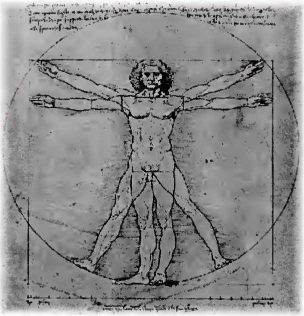
letter, the researcher received several E-mail requests to send the survey URL to a different E-mail address.

9. Investigate the availability of alternate Web-based survey software for future research. Researchers should consider additional features and updated functions.
10. Revise the University of Florida Health Behavior Survey based on the findings from this study. In the section on *Sexual Behaviors*, add the female condom to the list of contraceptive choices. Likewise, modify the section on *Dietary Behaviors* to reflect typical eating patterns as opposed to yesterday's eating pattern. For the items which ask participants to write in answers, provide explicit directions to acceptable responses (e.g. whole numbers only, no ranges).

Findings from this study confirmed Web-based surveys as a feasible method and a viable alternative to traditional mailed, self-administered surveys in a student population with open access to the Internet and World Wide Web. As colleges and universities institute computer requirements, and as students develop a greater trust and reliance on computers for courses and daily campus activities (e.g. registration, check grades, pay fees) Web-based surveys may eventually replace traditional campus data collection methods. While Web-based surveys may not supplant all traditional survey methodologies, their usefulness should continue to increase with advances in communications technology.

APPENDIX A
THE UNIVERSITY OF FLORIDA HEALTH BEHAVIOR SURVEY
MAILED, SELF-ADMINISTERED
UFHBS-M

The University of Florida
Health Behavior Survey
1999



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PO Box 118210
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The University of Florida
Health Behavior Survey

General Instructions

This survey is about health behaviors. The information you provide will help to identify the kind of health programs and services college students at the University of Florida need.

This survey has 99 questions and will take approximately 15 minutes to complete. Completing the survey is voluntary and the answers you give will be safeguarded to the fullest extent provided by law. You do not have to answer any question that you do not wish to answer and you may withdraw from the survey at any time without consequence. There is no direct benefit or anticipated risk to participants.

Your responses will be confidential. The survey has an identification number for follow-up purposes only. The responses you provide will not be connected to you. No individual responses will be reported, so please answer as honestly as you can. When you return your survey I will send you a $2 bill as a token of my appreciation.

If you have any questions concerning the survey, please contact me in Room 5, FLG, PO Box 118210, Gainesville, FL 32611, (352) 392-0583 ext. 285, or by email at lpealer@hhp.ufl.edu. Questions or concerns about participant rights can be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, FL 32611-2250, (352) 392-0433.

Return your completed survey in the enclosed self-addressed stamped envelope by **Friday, April 16, 1999.**

Thanks for your help!

Section A: Demographics

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

---

1. How old are you?
   - ☐ 18 years old
   - ☐ 19 years old
   - ☐ 20 years old
   - ☐ 21 years old
   - ☐ 22 years old
   - ☐ 23 years old
   - ☐ 24 years old
   - ☐ 25 years old
   - ☐ 26 years old
   - ☐ 27 years old or older

2. What is your sex?
   - ☐ Female
   - ☐ Male

3. What is your class standing?
   - ☐ Freshman
   - ☐ Sophomore
   - ☐ Junior
   - ☐ Senior
   - ☐ Graduate Student
   - ☐ Other

4. What is your current year in college?
   - ☐ 1st year
   - ☐ 2nd year
   - ☐ 3rd year
   - ☐ 4th year
   - ☐ 5th year
   - ☐ 6th year
   - ☐ 7th year
   - ☐ 8th year or beyond

5. Are you a full-time student?
   - ☐ Yes
   - ☐ No

6. How do you describe yourself?
   - ☐ American Indian or Alaskan Native
   - ☐ Asian or Pacific Islander
   - ☐ Black - not Hispanic
   - ☐ Hispanic or Latino
   - ☐ White - not Hispanic
   - ☐ Other

7. What is your marital status?
   - ☐ Never been married
   - ☐ Married
   - ☐ Separated
   - ☐ Divorced
   - ☐ Widowed

8. With whom do you currently live?
   - ☐ Alone
   - ☐ Spouse/domestic partner
   - ☐ Roommate(s)/Friend(s)
   - ☐ Parent(s)/Guardian(s)
   - ☐ Other relatives
   - ☐ Your children
   - ☐ Other

9. Where do you currently live?
   (Select all that apply)
   - ☐ College dormitory or residence hall
   - ☐ Fraternity or sorority house
   - ☐ Other university/college housing
   - ☐ Off-campus house or apartment
   - ☐ Parent/guardian's home
   - ☐ Other

10. Are you a member of a social fraternity or sorority?
    - ☐ Yes
    - ☐ No

11. How many hours a week do you work for pay?
    - ☐ 0 hours
    - ☐ 1-9 hours
    - ☐ 10-19 hours
    - ☐ 20-29 hours
    - ☐ 30-39 hours
    - ☐ 40 hours
    - ☐ More than 40 hours

12. Do you have any kind of health care coverage, including health insurance or prepaid plans such as HMOs (health maintenance organizations)?
    - ☐ Yes
    - ☐ No
    - ☐ Not sure

13. How much education does your mother have?
    - ☐ She did not finish high school
    - ☐ She graduated from high school or attained a GED
    - ☐ She had some education after high school
    - ☐ She graduated from college
    - ☐ Not sure

14. How much education does your father have?
    - ☐ He did not finish high school
    - ☐ He graduated from high school or attained a GED
    - ☐ He had some education after high school
    - ☐ He graduated from college
    - ☐ Not sure

Section B: Personal Safety And Violence

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

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15. How often do you wear a seat belt when riding in a car driven by someone else?
    - ☐ Never
    - ☐ Rarely
    - ☐ Sometimes
    - ☐ Most of the time
    - ☐ Always

16. How often do you wear a seat belt when driving a car?
    - ☐ I do not drive a car
    - ☐ Never wear a seat belt
    - ☐ Rarely wear a seat belt
    - ☐ Sometimes wear a seat belt
    - ☐ Most of the time wear a seat belt
    - ☐ Always wear a seat belt

17. During the past 12 months, how many times did you ride a motorcycle?
    - ☐ 0 times
    - ☐ 1 to 10 times
    - ☐ 11 to 20 times
    - ☐ 21 to 39 times
    - ☐ 40 or more times

18. When you rode a motorcycle during the past 12 months, how often did you wear a helmet?
    - ☐ I did not ride a motorcycle during the past 12 months
    - ☐ Never wore a helmet
    - ☐ Rarely wore a helmet
    - ☐ Sometimes wore a helmet
    - ☐ Most of the time wore a helmet
    - ☐ Always wore a helmet

19. During the past 12 months, how many times did you ride a bicycle?
    - ☐ 0 times
    - ☐ 1 to 10 times
    - ☐ 11 to 20 times
    - ☐ 21 to 39 times
    - ☐ 40 or more times

20. When you rode a bicycle during the past 12 months, how often did you wear a helmet?
    - ☐ I did not ride a bicycle during the past 12 months
    - ☐ Never wore a helmet
    - ☐ Rarely wore a helmet
    - ☐ Sometimes wore a helmet
    - ☐ Most of the time wore a helmet
    - ☐ Always wore a helmet

21. During the past 12 months, how many times did you go boating or swimming?
    - ☐ 0 times
    - ☐ 1 to 10 times
    - ☐ 11 to 20 times
    - ☐ 21 to 39 times
    - ☐ 40 or more times

22. When you went boating or swimming during the past 12 months, how often did you drink alcohol?
    - ☐ I did not go boating or swimming during the past 12 months
    - ☐ Never drank alcohol
    - ☐ Rarely drank alcohol
    - ☐ Sometimes drank alcohol
    - ☐ Most of the time drank alcohol
    - ☐ Always drank alcohol

23. During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 or 3 times
    - ☐ 4 or 5 times
    - ☐ 6 or more times

24. During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 or 3 times
    - ☐ 4 or 5 times
    - ☐ 6 or more times

25. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club? Do not count carrying a weapon as part of your job.
    - ☐ 0 days
    - ☐ 1 day
    - ☐ 2 or 3 days
    - ☐ 4 or 5 days
    - ☐ 6 or more days

26. During the past 30 days, on how many days did you carry a gun? Do not count carrying a gun as part of your job.
    - ☐ 0 days
    - ☐ 1 day
    - ☐ 2 or 3 days
    - ☐ 4 or 5 days
    - ☐ 6 or more days

27. During the past 12 months, how many times were you in a physical fight?
    - ☐ 0 times **[SKIP TO QUESTION 30]**
    - ☐ 1 time
    - ☐ 2 or 3 times
    - ☐ 4 or 5 times
    - ☐ 6 or 7 times
    - ☐ 8 or 9 times
    - ☐ 10 or 11 times
    - ☐ 12 or more times

28. During the past 12 months, with whom did you fight? **(Select all that apply.)**
    - ☐ A total stranger
    - ☐ A friend or someone I know
    - ☐ A boyfriend, girlfriend, or date
    - ☐ My spouse or domestic partner
    - ☐ A parent, brother, sister, or other family member
    - ☐ Other

29. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 or 3 times
    - ☐ 4 or 5 times
    - ☐ 6 or more times

30. During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?
    - ☐ Yes
    - ☐ No

Section C: Suicide Ideation And Attempts

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

Sometimes people feel so depressed and hopeless about the future that they may consider attempting suicide, that is taking some action to end their own life.

31. During the past 12 months, did you ever seriously consider attempting suicide?

☐ Yes
☐ No

32. During the past 12 months, did you make a plan about how you would attempt suicide?

☐ Yes
☐ No

33. During the past 12 months, how many times did you actually attempt suicide?

☐ 0 times
☐ 1 time
☐ 2 or 3 times
☐ 4 or 5 times
☐ 6 or more times

34. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose, that had to be treated by a doctor or nurse?

☐ I did not attempt suicide during the past 12 months
☐ Yes
☐ No

Section D: Tobacco Use

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

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35. Have you ever tried cigarette smoking, even one or two puffs?
    - ☐ Yes
    - ☐ No **[SKIP TO QUESTION 42]**

36. How old were you when you smoked a whole cigarette for the first time?
    - ☐ I have never smoked a whole cigarette
    - ☐ 12 years old or younger
    - ☐ 13 or 14 years old
    - ☐ 15 or 16 years old
    - ☐ 17 or 18 years old
    - ☐ 19 or 20 years old
    - ☐ 21 to 24 years old
    - ☐ 25 years old or older

37. During the past 30 days, on how many days did you smoke cigarettes?
    - ☐ 0 days
    - ☐ 1 or 2 days
    - ☐ 3 to 5 days
    - ☐ 6 to 9 days
    - ☐ 10 to 19 days
    - ☐ 20 to 29 days
    - ☐ All 30 days

38. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
    - ☐ I did not smoke cigarettes during the past 30 days
    - ☐ Less than 1 cigarette per day
    - ☐ 1 cigarette per day
    - ☐ 2 to 5 cigarettes per day
    - ☐ 6 to 10 cigarettes per day
    - ☐ 11 to 20 cigarettes per day
    - ☐ More than 20 cigarettes per day

39. Have you ever smoked cigarettes regularly, that is, at least one cigarette everyday for 30 days?
    - ☐ Yes
    - ☐ No

40. How old were you when you first started smoking cigarettes regularly (at least one cigarette every day for 30 days)?
    - ☐ I have never smoked cigarettes regularly
    - ☐ 12 years old or younger
    - ☐ 13 or 14 years old
    - ☐ 15 or 16 years old
    - ☐ 17 or 18 years old
    - ☐ 19 or 20 years old
    - ☐ 21 to 24 years old
    - ☐ 25 years old or older

41. Have you ever tried to quit smoking cigarettes?
    - ☐ Yes
    - ☐ No

42. During the past 30 days, on how many days did you use chewing tobacco or snuff, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?
    - ☐ 0 days
    - ☐ 1 or 2 days
    - ☐ 3 to 5 days
    - ☐ 6 to 9 days
    - ☐ 10 to 19 days
    - ☐ 20 to 29 days
    - ☐ All 30 days

43. During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?
    - ☐ 0 days
    - ☐ 1 or 2 days
    - ☐ 3 to 5 days
    - ☐ 6 to 9 days
    - ☐ 10 to 19 days
    - ☐ 20 to 29 days
    - ☐ All 30 days

Section E: Alcohol

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

The next 3 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

44. How old were you when you had your first drink of alcohol other than a few sips?

☐ I have never had a drink of alcohol other than a few sips **[SKIP TO QUESTION 47]**
☐ 12 years old or younger
☐ 13 or 14 years old
☐ 15 or 16 years old
☐ 17 or 18 years old
☐ 19 or 20 years old
☐ 21 to 24 years old
☐ 25 years old or older

45. During the past 30 days, on how many days did you have at least one drink of alcohol?

☐ 0 days
☐ 1 or 2 days
☐ 3 to 5 days
☐ 6 to 9 days
☐ 10 to 19 days
☐ 20 to 29 days
☐ All 30 days

46. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

☐ 0 days
☐ 1 day
☐ 2 days
☐ 3 to 5 days
☐ 6 to 9 days
☐ 10 to 19 days
☐ 20 or more days

Section F: Marijuana, Cocaine, and Other Drugs

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

47. During your life, how many times have you used marijuana?
    - ☐ 0 times **[SKIP TO QUESTION 50]**
    - ☐ 1 or 2 times
    - ☐ 3 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 to 39 times
    - ☐ 40 to 99 times
    - ☐ 100 or more times

48. How old were you when you tried marijuana for the first time?
    - ☐ 12 years old or younger
    - ☐ 13 or 14 years old
    - ☐ 15 or 16 years old
    - ☐ 17 or 18 years old
    - ☐ 19 or 20 years old
    - ☐ 21 to 24 years old
    - ☐ 25 years old or older

49. During the past 30 days, how many times did you use marijuana?
    - ☐ 0 times
    - ☐ 1 or 2 times
    - ☐ 3 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 to 39 times
    - ☐ 40 or more times

50. During your life, how many times have you used any form of cocaine including powder, crack, or freebase?
    - ☐ 0 times **[SKIP TO QUESTION 54]**
    - ☐ 1 or 2 times
    - ☐ 3 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 to 39 times
    - ☐ 40 to 99 times
    - ☐ 100 or more times

51. How old were you when you tried any form of cocaine, including powder, crack, or freebase, for the first time?
    - ☐ 12 years old or younger
    - ☐ 13 or 14 years old
    - ☐ 15 or 16 years old
    - ☐ 17 or 18 years old
    - ☐ 19 or 20 years old
    - ☐ 21 to 24 years old
    - ☐ 25 years old or older

52. During the past 30 days, how many times did you use any form of cocaine, including powder, crack, or freebase?
    - ☐ 0 times
    - ☐ 1 or 2 times
    - ☐ 3 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 to 39 times
    - ☐ 40 or more times

53. During your life, how many times have you used the crack or freebase forms of cocaine?
    - ☐ 0 times
    - ☐ 1 or 2 times
    - ☐ 3 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 to 39 times
    - ☐ 40 to 99 times
    - ☐ 100 or more times

54. During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
- ☐ 0 times
- ☐ 1 or 2 times
- ☐ 3 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 to 99 times
- ☐ 100 or more times

55. During your life, how many times have you taken steroid pills or shots without a doctor's prescription?
- ☐ 0 times
- ☐ 1 or 2 times
- ☐ 3 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 to 99 times
- ☐ 100 or more times

56. During your life, how many times have you used any other type of illegal drugs, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- ☐ 0 times
- ☐ 1 or 2 times
- ☐ 3 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 to 99 times
- ☐ 100 or more times

57. During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?
- ☐ 0 times
- ☐ 1 or 2 times
- ☐ 3 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times

58. During the past 30 days, how many times have you used any illegal drug in combination with drinking alcohol?
- ☐ 0 times
- ☐ 1 or 2 times
- ☐ 3 to 9 times
- ☐ 10 to 19 times
- ☐ 20 to 39 times
- ☐ 40 or more times

59. During your life how many times have you used a needle to inject any illegal drug into your body?
- ☐ 0 times
- ☐ 1 time
- ☐ 2 or more times

Section G: Sexual Behavior

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

The next 15 questions ask about sexual behavior. For the purpose of this survey, sexual intercourse is defined as vaginal intercourse, anal intercourse, or oral/genital sex.

60. How old were you when you had sexual intercourse for the first time?
    - ☐ I have never had sexual intercourse **[SKIP TO QUESTION 71]**
    - ☐ 12 years old or younger
    - ☐ 13 or 14 years old
    - ☐ 15 or 16 years old
    - ☐ 17 or 18 years old
    - ☐ 19 or 20 years old
    - ☐ 21 to 24 years old
    - ☐ 25 years old or older

61. During your life, with how many females have you had sexual intercourse?
    - ☐ I have never had sexual intercourse with a female
    - ☐ 1 female
    - ☐ 2 females
    - ☐ 3 females
    - ☐ 4 females
    - ☐ 5 females
    - ☐ 6 or more females

62. During the past 3 months, with how many females have you had sexual intercourse?
    - ☐ I have never had sexual intercourse with a female
    - ☐ I have had sexual intercourse with a female, but not during the past 3 months.
    - ☐ 1 female
    - ☐ 2 females
    - ☐ 3 females
    - ☐ 4 females
    - ☐ 5 females
    - ☐ 6 or more females

63. During your life, with how many males have you had sexual intercourse?
    - ☐ I have never had sexual intercourse with a male
    - ☐ 1 male
    - ☐ 2 males
    - ☐ 3 males
    - ☐ 4 males
    - ☐ 5 males
    - ☐ 6 or more males

64. During the past 3 months, with how many males have you had sexual intercourse?
    - ☐ I have never had sexual intercourse with a male
    - ☐ I have had sexual intercourse with a male, but not during the past 3 months
    - ☐ 1 male
    - ☐ 2 males
    - ☐ 3 males
    - ☐ 4 males
    - ☐ 5 males
    - ☐ 6 or more males

65. During the past 30 days, how many times did you have sexual intercourse?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 or 3 times
    - ☐ 4 to 9 times
    - ☐ 10 to 19 times
    - ☐ 20 or more times

66. During the past 30 days, how often did you or your partner use a condom?
   - ☐ I have not had sexual intercourse during the past 30 days
   - ☐ Never used a condom
   - ☐ Rarely used a condom
   - ☐ Sometimes used a condom
   - ☐ Most of the time used a condom
   - ☐ Always used a condom

67. The last time you had sexual intercourse, did you or your partner use a condom?
   - ☐ Yes
   - ☐ No

68. Did you drink alcohol or use drugs before you had sexual intercourse the last time?
   - ☐ Yes
   - ☐ No

69. The last time you had sexual intercourse, what method did you or your partner use to prevent pregnancy? **(Select all that apply.)**
   - ☐ No method was used to prevent pregnancy
   - ☐ Birth control pills
   - ☐ Condoms
   - ☐ Depo-Provera (injectable birth control)
   - ☐ Withdrawal
   - ☐ Some other method
   - ☐ Not sure

70. How many times have you been pregnant or gotten someone pregnant?
   - ☐ 0 times
   - ☐ 1 time
   - ☐ 2 or more times
   - ☐ Not sure

71. During your life, have you ever been forced to have sexual intercourse against your will?
   - ☐ Yes
   - ☐ No **[SKIP TO QUESTION 74]**

72. How old were you the first time you were forced to have sexual intercourse against your will?
   - ☐ 4 years old or younger
   - ☐ 5 to 12 years old
   - ☐ 13 or 14 years old
   - ☐ 15 or 16 years old
   - ☐ 17 or 18 years old
   - ☐ 19 or 20 years old
   - ☐ 21 to 24 years old
   - ☐ 25 years old or older

73. How old were you the last time you were forced to have sexual intercourse against your will?
   - ☐ 4 years old or younger
   - ☐ 5 to 12 years old
   - ☐ 13 or 14 years old
   - ☐ 15 or 16 years old
   - ☐ 17 or 18 years old
   - ☐ 19 or 20 years old
   - ☐ 21 to 24 years old
   - ☐ 25 years old or older

74. Have you ever had your blood tested for the AIDS virus/HIV infection?
   - ☐ Yes
   - ☐ No
   - ☐ Not sure

Section H: Body Weight

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

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75. How do you describe your weight?
    - ☐ Very underweight
    - ☐ Slightly underweight
    - ☐ About the right weight
    - ☐ Slightly overweight
    - ☐ Very overweight

76. Which of the following are you trying to do about your weight?
    - ☐ Lose weight
    - ☐ Gain weight
    - ☐ Stay the same weight
    - ☐ I am not trying to do anything about my weight

77. During the past 30 days, did you diet to lose weight or to keep from gaining weight?
    - ☐ Yes
    - ☐ No

78. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?
    - ☐ Yes
    - ☐ No

79. During the past 30 days did you vomit or take laxatives to lose weight or to keep from gaining weight?
    - ☐ Yes
    - ☐ No

80. During the past 30 days, did you take diet pills to lose weight or to keep from gaining weight?
    - ☐ Yes
    - ☐ No

81. What is your height? (Please write on the line provided.)

    ________ Feet ________ Inches

82. What is your weight? (Please write on the line provided.)

    ________ Pounds

Section I: Dietary Behaviors

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

The next 7 questions ask about food you ate yesterday. Think about all meals and snacks you ate yesterday from the time you got up until you went to bed. Be sure to include food you ate at home, on campus, at restaurants, or anywhere else.

83. Yesterday, how many times did you **eat fruit?**
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

84. Yesterday, how many times did you drink **fruit juice**?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

85. Yesterday, how many times did you eat **green salad**?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

86. Yesterday, how many times did you eat **cooked vegetables**?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

87. Yesterday, how many times did you eat **hamburger, hot dogs, or sausage?**
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

88. Yesterday, how many times did you eat **french fries or potato chips?**
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

89. Yesterday, how many times did you eat **cookies, doughnuts, pie, or cake**?
    - ☐ 0 times
    - ☐ 1 time
    - ☐ 2 times
    - ☐ 3 or more times

Section J: Physical Activity

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

90. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activity?
☐ 0 days
☐ 1 day
☐ 2 days
☐ 3 days
☐ 4 days
☐ 5 days
☐ 6 days
☐ 7 days

91. On how many of the past 7 days did you do stretching exercises, such as toe touching, knee bending, or leg stretching?
☐ 0 days
☐ 1 day
☐ 2 days
☐ 3 days
☐ 4 days
☐ 5 days
☐ 6 days
☐ 7 days

92. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push ups, sit-ups, or weight lifting?
☐ 0 days
☐ 1 day
☐ 2 days
☐ 3 days
☐ 4 days
☐ 5 days
☐ 6 days
☐ 7 days

93. On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work.)
☐ 0 days
☐ 1 day
☐ 2 days
☐ 3 days
☐ 4 days
☐ 5 days
☐ 6 days
☐ 7 days

94. During this school year, have you been enrolled in a physical education class?
☐ Yes
☐ No

95. During this school year, on how many college sports teams (intramural or extramural) did you participate?
☐ 0 teams
☐ 1 team
☐ 2 teams
☐ 3 or more teams

Section K: Health Information

- Place a check mark ☐ in the box beside the response that best applies to you.
- Mark only one answer to each question unless otherwise indicated.

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96. Have you ever been taught about AIDS or HIV infection in your college classes?
    - ☐ Yes
    - ☐ No
    - ☐ Not sure

97. During this school year, where on your college campus did you receive information about avoiding AIDS or HIV infection? **(Select all that apply.)**
    - ☐ College classes
    - ☐ Residence hall or other campus housing
    - ☐ Student clubs or organizations
    - ☐ Student health center
    - ☐ Health fair
    - ☐ Pamphlets, brochures, or newsletters
    - ☐ College newspapers
    - ☐ Informal discussion with friends
    - ☐ Other
    - ☐ I did not receive any information

98. On which of the following health topics have you ever received information from you college or university? **(Select all that apply.)**
    - ☐ Tobacco use prevention
    - ☐ Alcohol and other drug use prevention
    - ☐ Violence prevention
    - ☐ Injury prevention
    - ☐ Suicide prevention
    - ☐ Pregnancy prevention
    - ☐ Sexually transmitted disease (STD) prevention
    - ☐ AIDS or HIV infection prevention
    - ☐ Dietary behaviors and nutrition
    - ☐ Physical activity and fitness

99. Would you have been willing to complete this survey on the World Wide Web?
    - ☐ Yes
    - ☐ No
    - ☐ Not sure

Place the survey in the enclosed self-addressed stamped envelope and drop in the mail. Please mail by **Friday, April 16, 1999.** If you misplaced the envelope, please mail to: Lisa Pealer, Department of Health Science Education, University of Florida, PO Box 118210, Gainesville, FL 32611-8210.

THANKS!

APPENDIX B

THE UNIVERSITY OF FLORIDA HEALTH BEHAVIOR SURVEY WEB-BASED

UFHBS-W

University of Florida

Health Behavior Survey

This survey has 99 questions and will take approximately 15 minutes to complete. Completing the survey is voluntary and the answers you give will be safeguarded to the fullest extent provided by law. You do not have to answer any question that you do not wish to answer.

DIRECTIONS: Use the left-click of the mouse to select your answer. Some items ask for you to type in information using the keyboard.

A. Demographics

1. How old are you?

2. What is your sex?

○ Female
○ Male

3. What is your class standing?

○ Freshman
○ Sophomore
○ Junior
○ Senior
○ Graduate Student
○ Other

4. What is your current year in college?

○ 1st year
○ 2nd year
○ 3rd year

○ 4th year
○ 5th year
○ 6th year
○ 7th year
○ 8th year or beyond

5. Are you a full-time student?

○ Yes
○ No

6. How do you describe yourself?

○ American Indian or Alaska Native
○ Asian or Pacific Islander
○ Black - not Hispanic
○ Hispanic or Latino
○ White - not Hispanic
○ Other

7. What is your marital status?

○ Never been married
○ Married
○ Separated
○ Divorced
○ Widowed

8. With whom do you currently live? **(Select all that apply.)**

☐ Alone
☐ Spouse/domestic partner
☐ Roommate(s)/Friend(s)
☐ Parent(s)/Guardian(s)
☐ Other relatives
☐ Your children
☐ Other

9. Where do you currently live?

○ College dormitory or

residence hall

○ Fraternity or sorority house

○ Other university/college housing

○ Off-campus house or apartment

○ Parent/guardian's home

○ Other

10. Are you a member of a social fraternity or sorority?

○ Yes

○ No

11. How many hours a week do you work for pay?

○ 0 hours

○ 1-9 hours

○ 10-19 hours

○ 20-29 hours

○ 30-39 hours

○ 40 hours

○ More than 40 hours

12. Do you have any kind of health care coverage, including health insurance or prepaid plans such as HMOs (health maintenance organizations)?

○ Yes

○ No

○ Not sure

13. How much education does your mother have?

○ She did not finish high school

○ She graduated from high school or attained a GED

○ She had some education after high school

○ She graduated from college

○ Not sure

14. How much education does your father have?

○ He did not finish high school

○ He graduated from high school or attained a GED

○ He had some education after high school

○ He graduated from college

○ Not sure

15. Where are you completing this survey?

○ College dormitory or residence hall

○ Fraternity or sorority house

○ University/college computer laboratory

○ Off-campus house or apartment

○ Parent/guardian's home

○ Other

B. Personal Safety and Violence

16. How often do you wear a seat belt when riding in a car driven by someone else?

○ Never

○ Rarely

○ Sometimes

○ Most of the time

○ Always

17. How often do you wear a seat belt when driving a car?

○ I do not drive a car
○ Never wear a seat belt
○ Rarely wear a seat belt
○ Sometimes wear a seat belt
○ Most of the time wear a seat belt
○ Always wear a seat belt

18. During the past 12 months, how many times did you ride a motorcycle?

○ 0 times
○ 1 to 10 times
○ 11 to 20 times
○ 21 to 39 times
○ 40 or more times

19. When you rode a motorcycle during the past 12 months, how often did you wear a helmet?

○ I did not ride a motorcycle during the past 12 months
○ Never wore a helmet
○ Rarely wore a helmet
○ Sometimes wore a helmet

○ Most of the time wore a helmet
○ Always wore a helmet

20. During the past 12 months, how many times did you ride a bicycle?

○ 0 times
○ 1 to 10 times
○ 11 to 20 times
○ 21 to 39 times
○ 40 or more times

21. When you rode a bicycle during the past 12 months, how often did you wear a helmet?

○ I did not ride a bicycle during the past 12 months

○ Never wore a helmet

○ Rarely wore a helmet

○ Sometimes wore a helmet

○ Most of the time wore a helmet

○ Always wore a helmet

22. During the past 12 months, how many times did you go boating or swimming?

○ 0 times

○ 1 to 10 times

○ 11 to 20 times

○ 21 to 39 times

○ 40 or more times

23. When you went boating or swimming during the past 12 months, how often did you drink alcohol?

○ I did not go boating or swimming during the past 12 months

○ Never drank alcohol

○ Rarely drank alcohol

○ Sometimes drank alcohol

○ Most of the time drank alcohol

○ Always drank alcohol

24. During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?

○ 0 times

○ 1 time

○ 2 or 3 times

○ 4 or 5 times

○ 6 or more times

25. During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?

○ 0 times
○ 1 time
○ 2 or 3 times
○ 4 or 5 times
○ 6 or more times

26. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club? Do not count carrying a weapon as part of your job.

○ 0 days
○ 1 day
○ 2 or 3 days
○ 4 or 5 days
○ 6 or more days

27. During the past 30 days, on how many days did you carry a gun? Do not count carrying a gun as part of your job.

○ 0 days
○ 1 day
○ 2 or 3 days
○ 4 or 5 days
○ 6 or more days

28. During the past 12 months, how many times were you in a physical fight?

○ 0 times [Go to question 31]
○ 1 time
○ 2 or 3 times
○ 4 or 5 times
○ 6 or 7 times
○ 8 or 9 times
○ 10 or 11 times
○ 12 or more times

29. During the past 12 months, with whom

did you fight? **(Select all that apply.)**

☐ A total stranger
☐ A friend or someone I know
☐ A boyfriend, girlfriend, or date
☐ My spouse or domestic partner
☐ A parent, brother, sister, or other family member
☐ Other

30. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?

○ 0 times
○ 1 time
○ 2 or 3 times
○ 4 or 5 times
○ 6 or more times

31. During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?

○ Yes
○ No

C. Suicide Ideations

Sometimes people feel so depressed and hopeless about the future that they may consider attempting suicide, that is taking some action to end their own life. The next 4 questions ask about suicide.

32. During the past 12 months, did you ever seriously consider attempting suicide?

○ Yes
○ No

33. During the past 12 months, did you

make a plan about how you would attempt suicide?

○ Yes
○ No

34. During the past 12 months, how many times did you actually attempt suicide?

○ 0 times
○ 1 time
○ 2 or 3 times
○ 4 or 5 times
○ 6 or more times

35. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose, that had to be treated by a doctor or nurse?

○ I did not attempt suicide during the past 12 months
○ Yes
○ No

D. Tobacco Use

36. Have you ever tried cigarette smoking, even one or two puffs?

○ Yes
○ No [Go to question 43]

37. How old were you when you smoked a whole cigarette for the first time?

○ I have never smoked a whole cigarette
○ 12 years old or younger
○ 13 or 14 years old
○ 15 or 16 years old
○ 17 or 18 years old
○ 19 or 20 years old
○ 21 to 24 years old

○ 25 years old or older

38. During the past 30 days, on how many days did you smoke cigarettes?

○ 0 days
○ 1 or 2 days
○ 3 to 5 days
○ 6 to 9 days
○ 10 to 19 days
○ 20 to 29 days
○ All 30 days

39. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

○ I did not smoke cigarettes during the past 30 days
○ Less than 1 cigarette per day
○ 1 cigarette per day
○ 2 to 5 cigarettes per day
○ 6 to 10 cigarettes per day
○ 11 to 20 cigarettes per day
○ More than 20 cigarettes per day

40. Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?

○ Yes
○ No

41. How old were you when you first started smoking cigarettes regularly (at least one cigarette every day for 30 days)?

○ I have never smoked cigarettes regularly
○ 12 years old or younger
○ 13 or 14 years old
○ 15 or 16 years old

○ 17 or 18 years old
○ 19 or 20 years old
○ 21 to 24 years old
○ 25 years old or older

42. Have you ever tried to quit smoking cigarettes?

○ Yes
○ No

43. During the past 30 days, on how many days did you use chewing tobacco or snuff, such as Redman, Levi Garrett, Beechnut, Skoal Bandits, or Copenhagen?

○ 0 days
○ 1 or 2 days
○ 3 to 5 days
○ 6 to 9 days
○ 10 to 19 days
○ 20 to 29 days
○ All 30 days

44. During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars?

○ 0 days
○ 1 or 2 days
○ 3 to 5 days
○ 6 to 9 days
○ 10 to 19 days
○ 20 to 29 days
○ All 30 days

E. Alcohol

The next 3 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

45. How old were you when you had your first drink of alcohol other than a few sips?

- ○ I have never had a drink of alcohol other than a few sips [Go to question 48]
- ○ 12 years old or younger
- ○ 13 or 14 years old
- ○ 15 or 16 years old
- ○ 17 or 18 years old
- ○ 19 or 20 years old
- ○ 21 to 24 years old
- ○ 25 years old or older

46. During the past 30 days, on how many days did you have at least one drink of alcohol?

- ○ 0 days
- ○ 1 or 2 days
- ○ 3 to 5 days
- ○ 6 to 9 days
- ○ 10 to 19 days
- ○ 20 to 29 days
- ○ All 30 days

47. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

- ○ 0 days
- ○ 1 day
- ○ 2 days
- ○ 3 to 5 days
- ○ 6 to 9 days
- ○ 10 to 19 days
- ○ 20 or more days

F. Marijuana, Cocaine, and Other Drugs.

48. During your life, how many times have

you used marijuana?

- ○ 0 times [Go to question 51]
- ○ 1 or 2 times
- ○ 3 to 9 times
- ○ 10 to 19 times
- ○ 20 to 39 times
- ○ 40 to 99 times
- ○ 100 or more times

49. How old were you when you tried marijuana for the first time?

- ○ 12 years old or younger
- ○ 13 or 14 years old
- ○ 15 or 16 years old
- ○ 17 or 18 years old
- ○ 19 or 20 years old
- ○ 21 to 24 years old
- ○ 25 years old or older

50. During the past 30 days, how many times did you use marijuana?

- ○ 0 times
- ○ 1 or 2 times
- ○ 3 to 9 times
- ○ 10 to 19 times
- ○ 20 to 39 times
- ○ 40 or more times

51. During your life, how many times have you used any form of cocaine including powder, crack, or freebase?

- ○ 0 times [Go to question 55]
- ○ 1 or 2 times
- ○ 3 to 9 times
- ○ 10 to 19 times
- ○ 20 to 39 times
- ○ 40 to 99 times

○ 100 or more times

52. How old were you when you tried any form of cocaine, including powder, crack, or freebase, for the first time?

○ 12 years old or younger
○ 13 or 14 years old
○ 15 or 16 years old
○ 17 or 18 years old
○ 19 or 20 years old
○ 21 to 24 years old
○ 25 years old or older

53. During the past 30 days, how many times did you use any for of cocaine, including powder, crack, or freebase?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 or more times

54. During your life, how many times have you used the crack or freebase forms of cocaine?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 to 99 times
○ 100 or more times

55. During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times

○ 10 to 19 times
○ 20 to 39 times
○ 40 to 99 times
○ 100 or more times

56. During your life, how many times have you taken steroid pills or shots without a doctor's prescription?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 to 99 times
○ 100 or more times

57. During your life, how many times have you used any other type of illegal drugs, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 to 99 times
○ 100 or more times

58. During the past 30 days, how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 or more times

59. During the past 30 days, how many times have you used any illegal drug in combination with drinking alcohol?

○ 0 times
○ 1 or 2 times
○ 3 to 9 times
○ 10 to 19 times
○ 20 to 39 times
○ 40 or more times

60. During your life how many times have you used a needle to inject any illegal drug into your body?

○ 0 times
○ 1 time
○ 2 or more times

G. Sexual Behavior

The next 15 questions ask about sexual behavior. For the purpose of this survey, sexual intercourse is defined as vaginal intercourse, anal intercourse, or oral/genital sex.

61. How old were you when you had sexual intercourse for the first time?

○ I have never had sexual intercourse [Go to question 72]
○ 12 years old or younger
○ 13 or 14 years old
○ 15 or 16 years old
○ 17 or 18 years old
○ 19 or 20 years old
○ 21 to 24 years old
○ 25 years old or older

62. During your life, with how many females have you had sexual intercourse?

○ I have never had sexual intercourse with a female
○ 1 female

- ○ 2 females
- ○ 3 females
- ○ 4 females
- ○ 5 females
- ○ 6 or more females

63. During the past 3 months, with how many females have you had sexual intercourse?

- ○ I have never had sexual intercourse with a female
- ○ I have had sexual intercourse with a female, but not during the past 3 months.
- ○ 1 female
- ○ 2 females
- ○ 3 females
- ○ 4 females
- ○ 5 females
- ○ 6 or more females

64. During your life, with how many males have you had sexual intercourse?

- ○ I have never had sexual intercourse with a male
- ○ 1 male
- ○ 2 males
- ○ 3 males
- ○ 4 males
- ○ 5 males
- ○ 6 or more males

65. During the past 3 months, with how many males have you had sexual intercourse?

- ○ I have never had sexual intercourse with a male
- ○ I have had sexual intercourse with a male, but not during the past 3 months
- ○ 1 male
- ○ 2 males

○ 3 males
○ 4 males
○ 5 males
○ 6 or more males

66. During the past 30 days, how many times did you have sexual intercourse?

○ 0 times
○ 1 time
○ 2 or 3 times
○ 4 to 9 times
○ 10 to 19 times
○ 20 or more times

67. During the past 30 days, how often did you or your partner use a condom?

○ I have not had sexual intercourse during the past 30 days
○ Never used a condom
○ Rarely used a condom
○ Sometimes used a condom
○ Most of the time used a condom
○ Always used a condom

68. The last time you had sexual intercourse, did you or your partner use a condom?

○ Yes
○ No

69. Did you drink alcohol or use drugs before you had sexual intercourse the last time?

○ Yes
○ No

70. The last time you had sexual intercourse, what method did you or your partner use to prevent pregnancy? **(Select All That Apply)**

☐ No method was used to prevent pregnancy

☐ Birth control pills

☐ Condoms

☐ Depo-Provera (injectable birth control)

☐ Withdrawal

☐ Some other method

☐ Not sure

71. How many times have you been pregnant or gotten someone pregnant?

○ 0 times

○ 1 time

○ 2 or more times

○ Not sure

72. During your life, have you ever been forced to have sexual intercourse against your will?

○ Yes

○ No [Go to question 75]

73. How old were you the first time you were forced to have sexual intercourse against your will?

○ 4 years old or younger

○ 5 to 12 years old

○ 13 or 14 years old

○ 15 or 16 years old

○ 17 or 18 years old

○ 19 or 20 years old

○ 21 to 24 years old

○ 25 years old or older

74. How old were you the last time you were forced to have sexual intercourse against your will?

○ 4 years old or younger

○ 5 to 12 years old

○ 13 or 14 years old
○ 15 or 16 years old
○ 17 or 18 years old
○ 19 or 20 years old
○ 21 to 24 years old
○ 25 years old or older

75. Have you ever had your blood tested for the AIDS virus/HIV infection?

○ Yes
○ No
○ Not sure

H. Body Weight

76. How do you describe your weight?

○ Very underweight
○ Slightly underweight
○ About the right weight
○ Slightly overweight
○ Very overweight

77. Which of the following are you trying to do about your weight?

○ Lose weight
○ Gain weight
○ Stay the same weight
○ I am not trying to do anything about my weight

78. During the past 30 days, did you diet to lose weight or to keep from gaining weight?

○ Yes
○ No

79. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

○ Yes
○ No

80. During the past 30 days did you vomit or take laxatives to lose weight or to keep from gaining weight?

○ Yes
○ No

81. During the past 30 days, did you take diet pills to lose weight or to keep from gaining weight?

○ Yes
○ No

82. What is your height?

Feet ☐
Inches ☐

83. What is your weight?

Pounds ☐

I. Dietary Behaviors

The next 7 questions ask about food you ate yesterday. Think about all meals and snacks you ate yesterday from the time you got up until you went to bed. Be sure to include food you ate at home, on campus, at restaurants, or anywhere else.

84. Yesterday, how many times did you eat fruit?

○ 0 times
○ 1 time

○ 2 times
○ 3 or more times

85. Yesterday, how many times did you drink **fruit juice**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

86. Yesterday, how many times did you eat **green salad**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

87. Yesterday, how many times did you eat **cooked vegetables**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

88. Yesterday, how many times did you eat **hamburger, hot dogs, or sausage**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

89. Yesterday, how many times did you eat **french fries or potato chips**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

90. Yesterday, how many times did you eat **cookies, doughnuts, pie, or cake**?

○ 0 times
○ 1 time
○ 2 times
○ 3 or more times

J. Physical Activity

91. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activity?

○ 0 days
○ 1 day
○ 2 days
○ 3 days
○ 4 days
○ 5 days
○ 6 days
○ 7 days

92. On how many of the past 7 days did you do stretching exercises, such as toe touching, knee bending, or leg stretching?

○ 0 days
○ 1 day
○ 2 days
○ 3 days
○ 4 days
○ 5 days
○ 6 days
○ 7 days

93. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push ups, sit-ups, or weight lifting?

○ 0 days

○ 1 day
○ 2 days
○ 3 days
○ 4 days
○ 5 days
○ 6 days
○ 7 days

94. On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work.)

○ 0 days
○ 1 day
○ 2 days
○ 3 days
○ 4 days
○ 5 days
○ 6 days
○ 7 days

95. During this school year, have you been enrolled in a physical education class?

○ Yes
○ No

96. During this school year, on how many college sports teams (intramural or extramural) did you participate?

○ 0 teams
○ 1 team
○ 2 teams
○ 3 or more teams

K. Health Information

97. Have you ever been taught about AIDS or HIV infection in your college classes?

○ Yes

○ No

○ Not sure

98. During this school year, where on your college campus did you receive information about avoiding AIDS or HIV infection? **(Select all that apply.)**

☐ College classes

☐ Residence hall or other campus housing

☐ Student clubs or organizations

☐ Student health center

☐ Health fair

☐ Pamphlets, brochures, or newsletters

☐ College newspapers

☐ Informal discussion with friends

☐ Other

☐ I was not provided with any information

99. On which of the following health topics have you ever received information from you college or university? **(Select all that apply.)**

☐ Tobacco use prevention

☐ Alcohol and other drug use prevention

☐ Violence prevention

☐ Injury prevention

☐ Suicide prevention

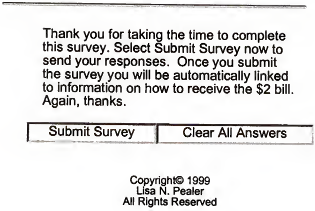
☐ Pregnancy prevention

☐ Sexually transmitted disease (STD) prevention

☐ AIDS or HIV infection prevention

☐ Dietary behaviors and nutrition

☐ Physical activity and fitness



Thank you for taking the time to complete this survey. Select Submit Survey now to send your responses. Once you submit the survey you will be automatically linked to information on how to receive the $2 bill. Again, thanks.

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APPENDIX C
PRE-NOTIFICATION
POSTCARD AND E-MAIL

March 17, 1999

Congratulations! You have been selected to participate in a study about health.

In the next few days you will receive a survey about health behaviors. By simply completing the survey I will send you a $2 bill as a token of my appreciation. So watch your mail (and GatorLink E-mail) for more information!

Sincerely,

Lisa Pealer
Project Coordinator
Department of Health Science Education

To: UFSTUDENT@ufl.edu
CC:
BC:
Subject: Health Behavior Survey

Congratulations! You have been selected to participate in a study about health.

In the next few days you will receive a survey about health behaviors. By simply completing the survey I will send you a $2 bill as a token of my appreciation. So watch your mail (and GatorLink E-mail) for more information!

Sincerely,

Lisa Pealer
Project Coordinator
Department of Health Science Education

APPENDIX D
COVER LETTER
MAILED, SELF-ADMINISTERED SURVEY
UFHBS-M

March 22, 1999

Hirk Miller
123 Main Street
Gainesville, FL 32603-1511

Dear Hirk Miller:

I am conducting a survey about health behavior. The information you provide will help to identify the kind of health programs and services college students need at the University of Florida.

I hope you will assist me by taking a few minutes to complete the enclosed survey. It is important you read the general instructions on page one of the survey. Please use the enclosed self-addressed stamped envelope to return your completed questionnaire. When you return the survey, I will send you a $2 bill as a token of my appreciation. Please return by **Friday, April 16, 1999**.

I appreciate your help. If you have any questions, please feel free to call (352) 392-0583 ext. 285 or email me at lpealer@hhp.ufl.edu.

Sincerely,

Lisa N. Pealer
Project Coordinator

APPENDIX E
E-MAIL NOTIFICATION OF SELECTION FOR UFHBS-W

To: ufstudent2@ufl.edu
CC:
BC:
Subject: Health Behavior Survey

Dear UF Student 2:

I am conducting a survey about health behavior. The information you provide will help to identify the kind of health programs and services college students need at the University of Florida.

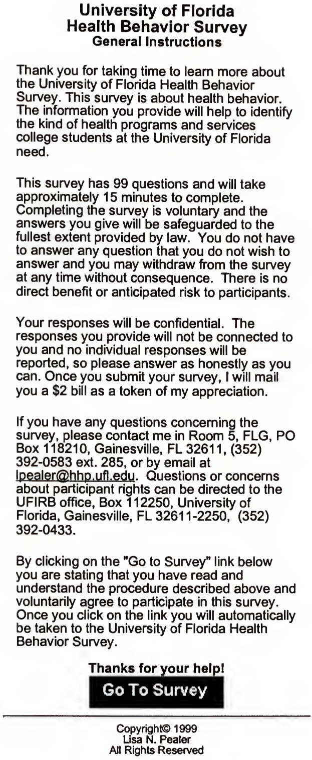
I hope you will assist me by taking a few minutes to complete a World Wide Web-based survey at http://www.hhp.ufl.edu/survey. Click on the Web address and you will be connected to more information about the Web-based survey. As compensation for your participation, I will mail you a $2 bill when I receive your survey. **Please complete the Web-based survey by Friday, April 16, 1999.**

I appreciate your help. If you have any questions, please feel free to call (352) 392-0583 ext. 285 or e-mail me at lpealer@hhp.ufl.edu.

Sincerely,

Lisa N. Pealer
Project Coordinator
Department of Health Science Education
University of Florida
Room 5 FLG
PO Box 118210
Gainesville, FL 32611-8210

APPENDIX F
COVER LETTER AND GENERAL INSTRUCTIONS
UFHBS-W



University of Florida
Health Behavior Survey
General Instructions

Thank you for taking time to learn more about the University of Florida Health Behavior Survey. This survey is about health behavior. The information you provide will help to identify the kind of health programs and services college students at the University of Florida need.

This survey has 99 questions and will take approximately 15 minutes to complete. Completing the survey is voluntary and the answers you give will be safeguarded to the fullest extent provided by law. You do not have to answer any question that you do not wish to answer and you may withdraw from the survey at any time without consequence. There is no direct benefit or anticipated risk to participants.

Your responses will be confidential. The responses you provide will not be connected to you and no individual responses will be reported, so please answer as honestly as you can. Once you submit your survey, I will mail you a $2 bill as a token of my appreciation.

If you have any questions concerning the survey, please contact me in Room 5, FLG, PO Box 118210, Gainesville, FL 32611, (352) 392-0583 ext. 285, or by email at lpealer@hhp.ufl.edu. Questions or concerns about participant rights can be directed to the UFIRB office, Box 112250, University of Florida, Gainesville, FL 32611-2250, (352) 392-0433.

By clicking on the "Go to Survey" link below you are stating that you have read and understand the procedure described above and voluntarily agree to participate in this survey. Once you click on the link you will automatically be taken to the University of Florida Health Behavior Survey.

Thanks for your help!

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APPENDIX G
REMINDER POSTCARD AND E-MAIL

March 29, 1999

Last week a survey about college health behaviors was mailed to you. You were randomly selected for participation in this study from all University of Florida students.

If you have already completed and returned it to me, please accept my sincere thanks. If not, please complete it today, so I may send you your $2 bill. Because it was only sent to a fraction of all college students at the University of Florida, it is extremely important you complete the survey so the study results may accurately represent the health behaviors of University of Florida students. I would like to receive your survey by **Friday, April 16, 1999.**

If you did not receive the survey, or it was misplaced, please call or E-mail me today and I will get another one in the mail to you as soon as possible. My phone number and E-mail address are (352) 392-0583 ext. 285 and lpealer@hhp.ufl.edu.

Sincerely,

Lisa Pealer
Project Coordinator

To: ufstudent@ufl.edu
CC:
BC:
Subject: Health Behavior Survey

Last week you received an e-mail message requesting you visit a Web-based survey concerning college health behaviors. You were randomly selected for participation in this study from all University of Florida students.

If you have already visited the site and completed the survey, please accept my sincere thanks. If not, please complete it today, so I may send you your $2 bill. Because it was only sent to a fraction of all college students at the University of Florida, it is extremely important you complete the questionnaire so the study results may accurately represent the health behaviors of University of Florida students. I would like to receive your survey by **Friday, April 16, 1999.**

If you did not receive the e-mail, or the Web addressed was misplaced, the address is http://www.hhp.ufl.edu/survey. If you have any questions please call or email me today at (352) 392-0583 ext. 285 or lpealer@hhp.ufl.edu.

Sincerely,

Lisa Pealer
Project Coordinator

APPENDIX H
EXPERT PANEL REVIEW
LIST OF PANEL MEMBERS

PANEL MEMBERS FOR INSTRUMENT ASSESSMENT

February 1999

1. Robert J. Bensley, Ph.D.
   HPER Department
   Western Michigan University
   Kalamazoo, MI 49008

2. Kelli McCormack Brown, Ph.D.
   Department of Community and Family Health
   College of Public Health
   University of South Florida
   13201 Bruce B. Downs Blvd. (MDC 56)
   Tampa, FL 33612-3805

3. Rebecca J. Cline, Ph.D.
   Communication Sciences and Disorders
   362 Dauer Hall
   PO Box 117420
   Gainesville Fl 32611-7420

4. Liliana DeLosReyes
   1005 SW 8th Avenue, #314C
   Gainesville, FL 32601

5. Gisell Lynn Gonzalvo
   3611 SW 34th Street, Apt. 238
   Gainesville, FL 32608-6576

6. Andy Miller, M.H.S.E., C.H.E.S.
   Health Education
   Student Health Care Center
   University of Florida
   PO Box 117500
   Gainesville Fl 32611-7500

7. Michele Moore, Ph.D., C.H.E.S.
Public Health
Western Kentucky University
1 Big Red Way
Bowling Green, KY

8. Barbara Rienzo, Ph.D.
Department of Health Science Education
University of Florida
PO Box 118210
Gainesville, FL 32611-8210

9. Julia Rae Varnes
20 Hume Hall West #306
Gainesville, FL 32612

10. Michael Young, Ph.D.
Department of Health Science, Kinesiology, Recreation, and Dance
College of Education and Health Professions
HPER 308K
Fayetteville, AR 72701

APPENDIX I
EXPERT PANEL REVIEW
INSTRUMENT ASSESSMENT PACKET

February 8, 1999

Robert J. Bensley
Associate Professor
Department of HPER
4024-5 SRC
Western Michigan University
Kalamazoo, MI 49008

Dr. Bensley:

Thank you for agreeing to review the instrument I am using for my doctoral research. You have been selected as a panel member based on your professional expertise in areas related to the instrument. The instrument you will be reviewing is a modified National College Health Risk Behavior Survey.

Your task is to identify instrument items which might be considered sensitive to undergraduate college students. Traditionally, instrument items are considered sensitive if they raise concerns about disapproval or other consequences (such as legal sanctions) for reporting truthfully or if the question itself is seen as an invasion of privacy. Items also may be considered sensitive if they are very personal or embarrassing in nature.

Enclosed you will find a copy of the instrument (beige), and an instrument assessment form (blue). You do not have to return the instrument.

I hope that you can complete the review and return the assessment form by **Monday, March 1, 1999.** A return envelope is enclosed for your convenience. If you prefer you may fax the item checklist to me at (352) 392-1909. Should you have any questions about your task or about returning the materials, please contact me by telephone (352) 392-0583 ext. 285 (office) or at (352) 372-2365 (home) or by e-mail at lpealer@hhp.ufl.edu.

Again, I thank you for your time and effort in serving as a panel reviewer. I look forward to receiving your assessment and comments.

Sincerely,

Lisa N. Pealer, M.H.S.E.
Graduate Teaching Assistant

Expert Panel Assessment Form

College Health Risk Behavior Survey

Your task is to identify questionnaire items which might be sensitive. Traditionally, questionnaire items are considered sensitive if they raise concerns about disapproval or other consequences (such as legal sanctions) for reporting truthfully or if the question itself is seen as an invasion of privacy. Items also may be considered sensitive if they are very personal or embarrassing in nature.

For each instrument item, please check YES if you believe it is sensitive, NO if you do not believe it is sensitive, and DON'T KNOW if you are unable to make the decision. If you have comments about a particular item, please make them in the space provided.

Section A: Demographics

1. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
2. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
3. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
4. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
5. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
6. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
7. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
8. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
9. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
10. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
11. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
12. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
13. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
14. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section B: Personal Safety and Violence

15. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

16. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

17. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

18. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

19. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

20. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

21. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

22. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

23. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

24. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

25. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

26. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

27. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

28. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

29. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

30. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

Section C: Suicide Ideation and Attempts

31. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

32. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

33. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

34. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

Section D: Tobacco Use

35. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

36. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

37. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

38. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ______________________

39. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

40. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

41. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

42. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

43. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section E: Alcohol

44. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

45. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

46. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section F: Marijuana, Cocaine, and Other Drugs

47. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

48. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

49. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

50. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

51. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

52. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

53. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

54. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

55. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

56. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

57. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

58. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

59. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section G: Sexual Behavior

60. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
61. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
62. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
63. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
64. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
65. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
66. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
67. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
68. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
69. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
70. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
71. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
72. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
73. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
74. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section H: Body Weight

75. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
76. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
77. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
78. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
79. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
80. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
81. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________
82. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section I: Dietary Behaviors

83. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

84. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

85. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

86. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

87. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

88. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

89. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section J: Physical Activity

90. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

91. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

92. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

93. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

94. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

95. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Section K: Health Information

96. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

97. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

98. ☐ YES ☐ NO ☐ DON'T KNOW Comments: ____________________

Please return this form in the enclosed, self-addressed stamped envelope. You may keep the questionnaire.

Thank you for your time and effort serving as an expert panel member.

APPENDIX J
UNIVERSITY OF FLORIDA
INSTITUTIONAL REVIEW BOARD APPLICATION

UNIVERSITY OF FLORIDA INSTITUTIONAL REVIEW BOARD

1. **Title of Project:**
The Feasibility of Collecting Health Risk Behavior Data From University Students Using World Wide Web Survey Research Technology

2. **Principal Investigator:**
Lisa N. Pealer, Doctor of Philosophy, Department of Health Science Education, Room 5 FLG, PO Box 118210, Gainesville, FL 32611-8210, (352) 392-0583 ext 285, lpealer@hhp.ufl.edu, (352) 392-1909.

3. **Supervisor** (if PI is student):
Steve Dorman, Room 5 FLG, PO Box 118210, sdorman@hhp.ufl.edu, 392-1909.

4. **Dates of Proposed Project:**
From: January 1, 1999 To: December 31, 1999.

5. **Source of Funding for the Project:**
None

6. **Scientific Purpose of the Investigation:**
The purpose of this study is to determine the feasibility of collecting health risk behavior data from a random sample of University of Florida undergraduate students using a Web-based survey.

7. **Describe the Research Methodology in Non-technical Language:**

This is an experimental study designed to compare two methods of collecting survey data about college health risk behaviors. Two modified versions of the 1995 National College Health Risk Behavior Survey (NCHRBS) have been developed. One version is a mailed, self-administered questionnaire, CHRBS-M. The second version is modified for Web administration, CHRBS-W. Participants will be randomly assigned to either the mailed, self-administered questionnaire group (CHRBS-M) or the Web-based survey group (CHRBS-W).

The sample will receive a postcard via regular United States postal mail and an electronically mailed pre-notification message about the forthcoming survey. Four days later, one-half the sample will receive an e-mail message requesting participation in the Web-based survey. Participants choosing to visit the Web-based survey will be able to link directly from the E-mail message. The paper and pencil survey will be mailed to the other half of the sample three days following the pre-notification E-mail message and postcard.

Participants assigned to the CHRBS-M group will receive a survey packet in the mail that contains a cover letter, the questionnaire booklet, and a pre-addressed, postage paid return envelope. The questionnaire booklet will include general instructions and the 99 items. Participants in this group will mark their responses directly on the questionnaire.

Participants assigned to the CHRBS-W group will receive an E-mail message asking them to participate in the Web-based survey. If participants choose to participate they will be able to link directly from the E-mail message to the Web-based survey. The participants will be connected to the Web-based survey cover letter. The cover letter will describe to participants the nature of the survey and if participants agree to participate they will select a link which then takes them to the Web-based survey. Participants will select their answers on the survey using the left-click of the mouse or by typing in their responses using the computer keyboard. At the end of the survey participants will be instructed to select the "submit now" button to send the answers via E-mail to the researcher.

8. Potential Benefits and Anticipated Risks:

Potential benefits include the development of a new survey research methodology that circumvents traditional survey research problems including time and expense.

The project involves no more than minimal risk.

9. Describe How Participants Will Be Recruited, The Number and Age of the Participants, and Proposed Compensation (if any):

Participants will be randomly selected from a list of University of Florida undergraduate students who have a Gator Link account and are over the age of 18. From the list, 1000 names will be randomly selected. Upon IRB approval, NERDC has agreed to draw the random sample for the study.

Participants in both study groups will receive a $2 bill as compensation for their participation. Participants in the mail, self-administered questionnaire group will select their responses in the questionnaire booklet and return the booklet to the researcher. Once the researcher has received the questionnaire booklet, the follow-up code will be used to identify the participant and the $2 bill will be mailed.

Participants in the Web-based survey group will complete the instrument and select a "submit now" button when they are finished. Once they have selected the "submit now" button participants will immediately receive an electronic thank-you on the screen. The electronic thank-you again explains to participants they will receive a $2 bill as compensation for their participation. This thank-you is an electronic-form. Participants will have to complete this form which asks for personal information (name, address, phone number, and E-mail address) in order to receive the $2 bill. Once the researcher receives this information, participants will be mailed the $2 bill.

10. Describe the Informed Consent Process. Include a Copy of the Informed Consent Document (If Applicable).

The informed consent process for the paper and pencil group (CHRBS-M) will be included in the mailed survey packet. It will include an explanation of the procedures and steps taken to protect privacy in the General Instructions section on page 1 of the survey.

The informed consent process for the Web-based survey group (CHRBS-W) will be included in the survey cover letter participants visit prior to linking to the Web-based survey. It will include an explanation of the procedures and steps taken to protect privacy.

(See attached copies of the survey materials)

Principal Investigator's Signature	Date	Supervisor's Signature	Date

I approve this protocol for submission to UFIRB:

Department Chair or Director of Center   Date

UNIVERSITY OF
FLORIDA

Institutional Review Board

98A Psychology Bldg.
PO Box 112250
Gainesville, FL 32611-2250
Phone/Fax: (352) 392-0433
E-mail: irb2@ufl.edu
http://nervm.nerdc.ufl.edu/~ufirb

DATE: 13-Jan-99

TO: Ms. Lisa Pealer
PO Box 118210
Campus

FROM: C. Michael Levy, Chair
University of Florida
Institutional Review Board

SUBJECT: **Approval of Project # 1998 - 889**

TITLE: The Feasibility of Collecting Health Risk Behavior Data From University Students Using World Wide Web Survey Research Technology

FUNDING: Unfunded

I am pleased to advise you that the University of Florida Institutional Review Board has recommended approval of this project. Based on its review of your protocol, the UFIRB determined that this research presents no more than minimal risk to participants, and based on 45 CFR 46.117(c), authorizes you to administer the informed consent process as specified in the attached description.

If you wish to make any changes to this protocol, you must disclose your plans before you implement them so that the Board can assess their impact on your project. In addition, you must report to the Board any unexpected complications arising from the project that affect your participants.

If you have not completed this project by 12-Jan-00, please telephone our office (392-0433), and we will discuss the renewal process with you.

It is important that you keep your Department Chair informed about the status of this research project.

CML/ch

cc: Vice President for Research
Dr. Steve Dorman

Equal Opportunity / Affirmative Action Institution

APPENDIX K
SECOND REMINDER LETTER

Mailed, Self-Administered Survey Group

April 5, 1999

FIELD(name)
FIELD(address)

Dear FIELD(name),

Two weeks ago I sent you a questionnaire about the health behaviors of college students. The findings from the survey will be used to improve health education programs and services at the University of Florida, which are currently lacking overall.

Since your name was one of only 600 undergraduate students selected to participate in this needs assessment, it is important I receive your questionnaire. So far I have received 243 completed questionnaires, meaning that I have mailed a $2 bill to 243 participants. Yet, I need 380 completed questionnaires to make meaningful conclusions about the findings.

Your answers will be kept strictly confidential. No one will see your responses but me. Only aggregate findings will be reported and no individual responses will be included. Please take a few minutes to complete and return the questionnaire. If you have misplaced or lost the questionnaire, please contact me by phone at (352) 372-2365, (352) 392-0583 ext. 285, or by E-mail at lpealer@hhp.ufl.edu and I will mail you another one.

Remember, when I receive your questionnaire, I will send you a $2 bill as a token of my appreciation.

Many thanks.

Lisa Pealer
Project Coordinator

Web-based Survey Group

April 5, 1999

FIELD(name)
FIELD(address)

Dear FIELD(name),

Two weeks ago you received an E-mail from me asking for your participation in a Web-based survey about the health behaviors of college students. The findings from the survey will be used to improve health education programs and services at the University of Florida, which are currently lacking overall.

Since your name was one of only 600 undergraduate students selected to participate in this needs assessment, it is important I receive your survey. So far I have received 243 completed surveys, meaning that I have mailed a $2 bill to 243 participants. Yet, I need 380 completed questionnaires to make meaningful conclusions about the findings.

Your answers will be kept strictly confidential. No one will see your responses but me. Only aggregate findings will be reported and no individual responses will be included. Please take a few minutes to complete and return the survey. In case you have misplaced or lost the original E-mail request, you will find the Web survey at: http://www.hhp.ufl.edu/survey .

If you have any questions please contact me by phone at (352) 392-0583 ext. 285 or by E-mail at lpealer@hhp.ufl.edu. Remember, when I receive your survey I will send you a $2 bill as a token of my appreciation.

Many thanks.

Lisa Pealer
Project Coordinator

P.S. Check your GatorLink E-mail account (username@ufl.edu) for the original message.

APPENDIX L
PARTICIPANT THANK YOU CARD

Thank you for participating in my research project. As promised, I have enclosed a $2 bill as a token of my appreciation.

Again, thank you.

Best Wishes,

Lisa Pealer

APPENDIX M
WEB-BASED SURVEY GROUP
VERBATIM PARTICIPANT COMMENTS

Web-based Survey Group
Verbatim Participant Comments

- clear and concise survey, didnt miss a thing on student health
- Easy to do
- Made me think a lot. Seems to be well set up. I would like to see the results (email them if you can). I think major or gpa would be neat to determine if there is a correlation between smarts and answers to the survey questions.
- it was a straight to the point survey, easy to answer. i enjoyed providing my input.
- I was more than happy to do your survey and felt comfortable answering all of your questions (especially for a quick $2). However, I do not know how you can possibly expect any person who is perfomring any illegal activity to answer your questions when you have their full name, address, and email address. If I were you I would not take any response to any of the drug/carrying illegal weapon questions as being anthing other than someone having "fun" with your survey. I thought this viwepoint might have been overlooked. If you are looking for honest answers maybe setting up shop in Turlington Plaza with a big "Free $2" sign and anonymous questionaires might work. It may be that you are simply conducting the survey for reasons outside of my knowledge. I hope my feedback may be of some use. Thank you and good luck.
- It was a good survey. I am in advertising so I respect a good survey. i have administered my fair share.
- hmm. it made me realize i have to get off my butt, work out, and eat some more fruits and veggies.
- Good survey. However, responses to the questions refering to 'yesterday' and the 'last 7 days' may not be typical. For example, I've been traveling with my class for the last two days and my eating habits while on the road is obviously going to be different than when I'm on a regular schedule. Just some food for thought. Thanks for letting me participate.
- For $2??? Sure! I could earn $12 an hour this way.
- It was interesting and easy.
- The sexual activity questions aren't going to give you accurate feedback because the highest number of partners is 6--not even close!
- I hope that my answers have helped the survey. I found nothing that was rude or offensive.
- I thought you covered a lot of bases but one thing that I find to be very prevelent here, and very frightening are eating disorders. You might want to research them in greater depth.
- good...some of the questions worded strangely though
- The survey was good because it covered a variety of topics and I am sure that it will help in assessing the needs of students on this campus.
- It made me realize how healthy my lifestyle really is.
- It wasn't too personal and I appreciated the online form for convenience.

- I am curious to see how things go for you! I enjoyed your health class and learned a lot, thanks for everything!
- Was too long--- although I feel that some serious issues were addressed
- I liked how if the first answer didn't apply to you, it automatically skipped the next few questions.
- I would like to see the results of your survey when you are done.
- That survey was fine. Good job.
- it was good. but it could be better. with my help it could be the best.
- How are you going to utilize the information I have filled out?
- Godd Survey!!
- I liked it.
- It was interesting - do we get to know what you find out?
- I would have answered more questions, or liked it better if you had sent the survey to my address, instead of giving out information like this on the itnernet.
- It was a good survey.
- I do not know exactly what the survey is for (stereotypical purposes, etc.), but I still chose to participate. Also, I would like to know why for the purposes of this survey that sexual intercourse is defined as "oral sex." Is it because you can get AIDS/other STDs from it? I have never had vaginal/anal intercourse.
- I thought the questions were easy to answer.
- a good variety of questions, will be able to find out a great deal of information about our student population

- a good variety of questions, will be able to find out a great deal of information about our student population

- VERY INTERESTING AND THOROUGH. INSTRUCTIONS UNDERSTANDABLE AND NOT AMBIGUOUS. I WOULD SUGGEST THAT QUESTIONS PERTAINING TO FOOD CONSUMPTION SHOULD HAVE MORE VARIETY OF DIFFERENT FOODS (E.G. FISH, BREAD, MILK, CHOCOLATE, ETC.). GOOD LOOK IN YOUR STUDY!
- It was very detailed, but I liked it!
- I would like to know what the purpose of the study was and what conclusions you make after it is done. Without that information I can not give feedback about it.
- I would definitly like to see more info available to students about exercising, and nutrition.
- it was interesting, what is it going to be used for though?
- Are you guys taking into consideration that by doing it over the web, some people may not be entirely honest b/c most likely they'll have someone looking over their shoulder or waiting to use the computer?
- IT was an interesting survey, with a variety of topics, which was good. It also had topics that are everyday concerns of students, which is relevant.
- Made me feel pretty healthy

- sorry i didnt complete this sooner. i just checked my email today because of a letter i recieved from you. also, will results of this survey be available anywhere for me to see? thanks. bye. ben
- interesting survey, quick and to the point
- good and thorough...i'd like to know the results
- The survey provided a wide array about different behaviors, sometimes, I would've liked to have been able to explain an answer here and there so as to not be portrayed in an inaccurate manner (such as the drug use questions), but otherwise, it's pretty straightforward. I hope this information helps!
- for the questions about my diet and exercise---because it is getting close to the end of the semester, my schedule of activities has not been regular. As other students are also in this situation, I feel that these answers will not truly reflect our habits. Also, I think it would be better to ask what we eat on a typical day, rather than what we ate yesterday. It would be more accurate.
- What exactly is this for?
- It was quite extensive.
- On a few of the questions I was some where in between, but I answered the question as best I could. Good luck on constructing your results.
- very well rounded asks good questions
- Good questions. On the sex survey, I have been dating the same girl for three years. All my sexual encounters in this time have been with her.
- what will the survey results be used for
- It was grrr-eat!
- Kinda lengthy, but overall pretty thourough.
- A lot of personal questions.
- I am just curious as to what sort of study is being done and what the results will be if any.
- That was a very intense survey. You can learn a lot about me from it. It was not time consuming at all. I enjoyed doing it and would not mind doing another one.
- Well thought out. Liked the the fact that somebody put in skip when the questions wouldn't pretain to them.
- It hardly took any time and I enjoyed answering the questions.
- Thanks for allowing me to be apart of this survey, I hope it wasn't to late, but I do not check this email account ever! Good Luck!
- Thanks for allowing me to be apart of this survey, I hope it wasn't to late, but I do not check this email account ever! Good Luck!
- Interesting and hard hitting questions? When can we see some the reesults?
- I am not sure if this applies to your survey, but I think it would be interesting to see how many students have used marijuana while at school, when studying (and whether they think it "helps" them to study). Good luck with your work!

REFERENCES

Aday, L. A. (1996). Designing and conducting health surveys. (2nd ed.). San Francisco: Jossey-Bass.

Alexander, R. B., & Trissel, D. (1996). Chronic prostatitis: Results of an Internet survey. Urology, 48(4), 568-574.

Alreck, P. L., & Settle, R. B. (1995). The survey research handbook: Guidelines and strategies for conducting a survey (2nd ed.). Chicago: Irwin.

Beebe, T.J., Mika, T., Harrison, P.A., Anderson, R.E., & Fulkerson, J.A. (1997). Computerized school surveys. Social Science Computer Review, 15(2), 159-169.

Beebe, T.J., Harrison, P.A., McRae, J. A., Anderson, R.E., & Fulkerson, J.A. (1998) An evaluation of computer-assisted self-interviews in a school setting. Public Opinion Quarterly, 62(4), 623-624.

Bell, D.S., & Kahn, C.E. (1996). Health status assessment via the World Wide Web. Proceedings from the American Medical Informatics Association Annual Fall Symposium, 338-342.

Bell, S. (1994, December). Student satisfaction at York University, Canada. Paper presented at the Annual Conference of the Society for Research in Higher Education, York, England, UK. (ERIC Document Reproduction Service No. ED 388 188).

Bloom, D. E. (1998), Technology, experimentation, and the quality of survey data. Science, 280(5365), 847-848.

Booth-Kewley, S., Edwards, J.E., & Rosenfeld, P. (1992). Impression management, social desirability, and computer administration of attitude questionnaires: Does the computer make a difference? Journal of Applied Psychology, 77(4), 562-266.

Borer, M.J., Herbert, T.E., & Breshears, D. (1996). Cost and demand analysis of excimer laser use: First World Wide Web Internet survey of the interest in refractive surgery. Journal of Cataract Refractive Surgery, 22(6), 709-712.

Brener, N.D., Collins, J.L., Kann, L., Warren, C.W., & Williams (1995). Reliability of the youth risk behavior survey questionnaire. American Journal of Epidemiology, 141(6), 575-580.

CommerceNet Research Center (1998). World Wide Internet Statistics. [On-line]. Available: http://www.commercenet.net/research/stats/wwstats.html

Davis, P. (1995, January). Welcome to the World-Wide Web. Internet Librarian, p. 51-55.

December, J. (1994). Electronic publishing on the Internet: New traditions, new choices. Educational Technology, 34(7), 32-36.

de Leeuw, E., & Nicholls, W. (1996). Technological innovations in data collection: Acceptance, data quality, and costs. [On-line] Available: http://www.socresonline.org.uk/socresonline/1/4/leeuw.html

Denton, J. J., Tsai, C. T., & Chevrette, P. (1988). Effects on survey responses of subjects, incentives, and multiple mailings. Journal of Experimental Education, 56(2), 77-82.

Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion (1997). Youth risk behavior surveillance: National college health risk behavior survey--United States, 1995. In CDC Surveillance Summaries: Morbidity and Mortality Weekly Report, 46 (SS-6), 1-56.

Douglas, K.A, Collins, J.L., Warren, C., Kann, L., Gold, R., Clayton, S., Ross, J.G., & Kolbe, L.J. (1997). Results from the 1995 national college health risk behavior survey. Journal of American College Health, 46(2), 55-66.

Emerging Technologies Research Group (1995). The American Internet User Survey. [On-line] Available: http://etrg.findsvp.com/Internet/highlights.html

Finegan, J. E., & Allen, N. J. (1994). Computerized and written questionnaires: Are they equivalent? Computers in Human Behavior, 10(4), 483-496.

Fink, A. (1985). How to conduct surveys: A step-by-step guide. Beverly Hills, CA: Sage.

Fowler, F. J. (1984). Survey research methods. Beverly Hills, CA: Sage.

Gaddis, S. E. (1998). How to design online surveys. Training & Development, 52(6), 67-71.

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). Educational research: An introduction (6th ed.). White Plains, NY: Longman.

Gauger, R. (1994). Access the Internet: How to use this global resource for science education. The Science Teacher, 61(6), 26-29.

Gilbert, G. H., Longmate, J., & Branch, L. G. (1992). Factors influencing the effectiveness of mailed health surveys. Public Health Reports, 107(5), 576-584.

Good, K. P. (1997). A study of factors affecting responses in electronic mail surveys. Unpublished doctoral dissertation, Western Michigan University, Kalamazoo.

Goree, C. T., & Marszalek, J. F. (1995). Electronic surveys: Ethical issues for researchers. College Student Affairs Journal, 15(1), 75-79.

Goyder, J. (1987). The silent minority: Nonrespondents on sample surveys. Boulder, CO: Westview Press.

Graphics, Visualization, & Usability Center (1996). GVU's Sixth WWW User Survey.[On-line]. Available: http://www.cc.gatech.edu/gvu/user_surveys/survey-10-1996/

Hewson, C. M., Laurent, D., & Vogel, C. M. (1996). Proper methodologies for psychological and sociological studies conducted via the Internet. Behavior Research Methods, Instruments, & Computers, 28(2), 186-191.

Houston, J. D., & Fiore, D. C. (1998). Online medical surveys: Using the Internet as a research tool. M.D. Computing, 15(2), 116-120.

Internet Literacy Consultants (1998). ILC glossary of terms [On-line]. Available: http://www.matisse.net/files/glossary.html

Isaac, S., & Michael, W.B. (1995). Handbook in research and evaluation (3rd ed.) San Diego, CA: EdITS/Educational and Industrial Testing Services.

Johnston, J., & Walton, C. (1995). Reducing response effects for sensitive questions: A computer assisted self interview with audio. Social Science Computer Review, 13(3), 304-319.

Kanuk, L., & Berenson, C. (1975). Mail surveys and response rates: A literature review. Journal of Marketing Research, 12, 440-453.

Kiernan, V. (September 25, 1998). Researcher believes web surveys could benefit by offering freebies. The Chronicle of Higher Education, p. A32.

Kiesler, S., & Sproull, L. S. (1986). Response effects in the electronic survey. Public Opinion Quarterly, 50, 402-413.

Kittleson, M. J. (1995). An assessment of the response rate via the postal service and e-mail. Health Values, 18(2), 27-29.

Kittleson, M. J. (1997). Determining effective follow-up of e-mail surveys. American Journal of Health Behavior, 21(3), 193-196.

Klaucke, D. N., Buehler, J.W., Thacker, S. B., Parrish, R. G., Trowbridge, F. L., Berkelman, & Surveillance Coordination Group (1988). Guidelines for evaluating surveillance systems. Morbidity and Mortality Weekly Report, 37 (Suppl. 5), 1-18.

Kolbe, L.J., Kann, L., & Collins, J.L. (1993). Overview of the youth risk behavior surveillance system. Public Health Reports, 108 (Suppl. 1), 2-10.

Lautenschlager, G. J., Flaherty, V. L. (1990). Computer administration of questions: More desirable or more social desirability? Journal of Applied Psychology, 75(3), 310-314.

Lomarcan, D. L. (1995). Networks: The basics. Computers in Libraries, 15(3), 19-23.

Martin, C. L., & Nagao, D. H. (1989). Some effects of computerized interviewing on job applicant reponses. Journal of Applied Psychology, 74, 72-80.

Mehta, R. & Sivadas, E. (1995). Comparing response rates and response content in mail versus electronic mail surveys. Journal of the Market Research Society, 37(4), 429-439.

Microsoft Internet Explorer (1995). About Internet Explorer. Microsoft Corporation, 1985-1995 .

Moldstad, S., McMillan, C., Kher, N., & Kilcoyne, M. (1998). Family history and alcohol consumption patterns of college students at a rural southern university. Education, 142(1).

National Center for Chronic Disease Prevention and Health Promotion (1998a). Behavioral risk factor surveillance system. [On-line] Available: http://www.cdc.gov/nccdphp/behavior.htm

National Center for Chronic Disease Prevention and Health Promotion (1998b). Maternal and infant health surveillance: Pregnancy risk assessment monitoring system. [On-line] Available: http://www.cdc.gov/nccdphp/pregnanc.htm

National Center for Chronic Disease Prevention and Health Promotion (1998c). The national program of cancer registries.[On-line] Available: http://www.cdc.gov/nccdphp/survcanc.htm

National Center for Health Statistics (1998). The national center for health statistics. [On-line]Available: http://www.cdc.gov/nchswww

Netscape (1998). Net search tips. [On-line] Available: http://home.netscape.com/escapes/search/tips_0.html

Nielsen Media Research (1997). CommerceNet/Nielsen Internet Demographics Survey. [On-line] Available: http://www.commercenet/work/pilot/nielsen_96/index.html

Nunnally, J. C. (1978). Psychometric theory. New York: McGraw-Hill.

Opperman, M. (1995). E-mail surveys: Potential and pitfalls. Marketing Research: A Magazine of Management & Applications, 7(3), 29-33.

O'Reilly, J., Hubbard, M., Lessler, J., Blemer, D., & Turner, C. (1994). Audio and video computer assisted self interviewing: Preliminary tests of new technology for data collection. Journal of Statistics, 10, 197-214.

O'Rourke, D. P., & O'Rourke, T. W. (Spring/Summer, 1983). Improving response rates to health surveys using mail questionnaires. The Eta Sigma Gamman, 12-16.

Paperny, D. M., Aono, J. Y., Lehman, R. M., Hammar, S. L., Risser, J. (1990). Computer-assisted detection and intervention in adolescent high-risk health behaviors. The Journal of Pediatrics, 116(3), 456-462.

Parker, L. (1992). Collecting data the e-mail way. Training and Development, 46(7), 52-54.

Pitkow, J. E., & Recker, M. M. (1995). Using the Web as a survey tool: Results from the second WWW user survey. Computer Networks and ISDN Systems, 27, 809-822.

Relevant Knowledge® (1998). RelevantKnowledge's Most Recent Enumeration Study. [On-line]. Available: http://www.relevantknowlege.com/Press/release/05_04_98.html

Rossi, P. H., Wright, J. D., & Anderson, A. B. (Eds.). (1983). Handbook of survey research. Orlando, FL: Academic Press.

Santoro, G. M. (1994). The Internet: An overview. Communication Education, 43, 73-86.

Sarvela, P. D., & McDermott, R. J. (1993). Health education evaluation and measurement: A practitioner's perspective. Madison, WI: WCB Brown & Benchmark.

Sarvela, P. D., & McDermott, R. J. (1999). Health education evaluation and measurement: A practitioner's perspective (2nd ed). Madison, WI: WCB/McGraw-Hill.

Schmidt, W.C. (1997). World-Wide Web survey research: Benefits, potential problems, and solutions. Behavior Research Methods, Instruments, & Computers, 29(2), 274-279.

Schuldt, B. A., & Totten, J. W. (1994). Electronic mail vs. mail survey response rates. Marketing Research, 6(1), 36-39.

Shavelson, R. J. (1996). Statistical reasoning for the behavioral sciences (3rd ed). Boston, MA: Allyn and Bacon.

Skinner, H. A., & Allen, B. A. (1983). Does the computer make a difference? Computerized versus face-to-face versus self-report assessment of alcohol, drug, and tobacco use. Journal of Consulting and Clinical Psychology, 51(2), 267-275.

Soetikno, R. M., Mrad, R., Pao, V., & Lenert, L.A. (1997). Quality-of-life research on the Internet: Feasibility and potential biases in patients with ulcerative colitis. Journal of the American Medical Informatics Association, 4(6), 426-435.

Soetikno, R. M., Provenzale, D., & Lenert, L.A. (1997). Studying ulcerative colitis over the World Wide Web. The American Journal of Gastroenterology, 92(3), 457-460.

Sproull, L.S. (1986). Using electronic mail for data collection in organizational research. Academy of Management Journal, 29(1), 159-169.

Starr, R. M. (1997). Delivering instruction on the World Wide Web: Overview and basic design principles. Educational Technology, 37(3), 7-15.

Stones, A., & Perry, D. (1997). Survey questionnaire data on panic attacks gathered using the World Wide Web. Depression and Anxiety, 6(2), 86-87.

Stussman, B. (1996). Network terms to get you through the 1990s. Journal of School Health, 66(5), 183-185.

Taulois-Braga, W., & Marcenes, W. (1995). Electronic-mail: A new tool for data collection in dental public health. Community Dentistry and Oral Epidemiology, 23, 379-380.

Thatch, L. (1995). Using electronic mail to conduct survey research. Educational Technology, 35(2), 27-31.

Tourangeau, R. & Smith, T.W. (1996). Asking sensitive questions: The impact of data collection mode, question format, and question context. Public Opinion Quarterly, 60, 275-304.

Truppin, A., Benson, D., Nelson, P., Washburn, S., & Henning, J. (1997). Perseus survey solutions for the Web: User guide. Braintree, MA: Perseus Development Corp.

Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. D., Pleck, J. H., & Sonenstein, F. L. (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. Science, 280(5635), 867-873.

Turner, J. L. & Turner, D. B. (1998). Using the Internet to perform survey research. Syllabus, 12(4), 58-61.

University of Florida (1998, June 25). University of Florida student computer requirements [On-line]. Available: http://www.circa.ufl.edu/computers/

United States Department of Health and Human Services (1996). National survey results on drug use from the Monitoring the Future Study, 1975-1994. (NIH Publication No. 96-4027). Rockville, MD.

Vanouplines, P., & Nieuwenhuysen, P. (1996, December). Highly interactive WWW services: A new type of information sources. In Online Information 96, Proceedings of the International Online Information Meeting, London, England, (ERIC Document Reproduction Service No. ED 411 857)

Weiler, R. M. (1997). Adolescents' perceptions of health concerns: An exploratory study among rural midwestern youth. Health Education and Behavior, 24(3), 287-299.

Wentland, E. J., & Smith, K. W. (1993). Survey responses: An evaluation of their validity. San Diego, CA: Academic Press.

Wu, H. F. M. (1997). Use of web-based survey instrument to collect, analyze and present course evaluation data. Unpublished doctoral dissertation, George Washington University, Washington, DC.

BIOGRAPHICAL SKETCH

Born and reared in Florida, Lisa Nicole Pealer began her studies at the University of Florida in 1988 as an undergraduate in the College of Liberal Arts and Sciences. In 1992, she graduated with honors, receiving a bachelor's degree in communication processes and disorders, with a specialization in health communication. In 1994, she returned to the University of Florida to pursue a master's in health science education and earned this degree in the spring of 1996 with a specialization in public health. In the summer of 1996, Lisa was accepted into the Ph.D. program in the Department of Health Science Education. Throughout her graduate studies, Lisa maintained an active academic agenda. In addition to her own dissertation research and teaching schedule, she was involved with several research projects and was active in professional associations. Lisa will be joining the faculty of the College of Education at the University of Cincinnati in the fall of 1999.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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